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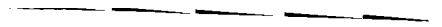
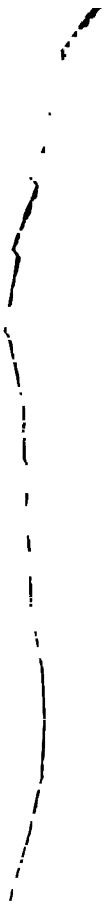
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THE INTERNATIONAL YEAR BOOK

A COMPENDIUM OF THE WORLD'S PROGRESS
DURING THE YEAR

1899

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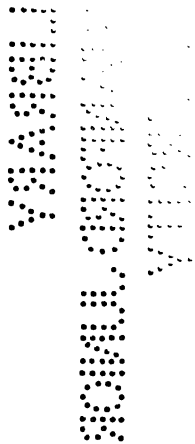
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PREFACE.

The record of the year 1899 is an unusually full one. In the United States the development of trade, industry, and agriculture marks it as one of the most prosperous years in our history, and our political record has an especial interest from the new issues that have presented themselves in connection with our colonial policy. In international and foreign affairs the topics that have come up for treatment are numerous and varied. Besides the war in the Transvaal, the list comprises The Hague Conference, the Alaska Boundary Dispute, the settlement of the Fashoda affair, the new international status of Japan, the Anglo-Russian agreement respecting China, and the new turn in the Dreyfus affair. The discussion of scientific topics has been unusually interesting. Important discoveries have been made in the departments of Archæology, Medicine, Anthropology, Experimental Psychology, Engineering, Geology, Chemistry, Botany, and Physics. New men have come forward, and men already well known have added to their records, necessitating the inclusion of an unusually large number of biographical articles. Biographies of the living include such names as Roberts, Buller, Rhodes, and Kruger, while on the death list are Lawton, Joubert, Coues, Moody, Ingersoll, Dingley, and many others. The new books and new plays requiring mention fill many pages. Important experiments have been made in municipal government. In short, the abundance of material has made the problem of condensation exceedingly difficult, especially as the YEAR BOOK aims to be something more than a bare record of facts or compilation of statistics, its object being to discuss as well the debated questions of the year, with a view to exhibiting fairly the opposing views. The essential features of the original plan have been retained. The work being designed to supplement or continue the principal cyclopædias,

and at the same time to serve independently as an annual work of reference, the single alphabetical arrangement has been adopted, and the topics have generally been placed under their own heads rather than grouped under titles which could be ascertained only by reference to the table of contents. This seemed best suited to the double office which the book was intended to fulfil—namely, that of a year book and of a cyclopædia appendix.

Frank Moore Colby.

UNIVERSITY HEIGHTS, May 9, 1900.

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THE INTERNATIONAL YEAR BOOK 1899

ABRASIVES. The value of the abrasive products in the United States, both domestic and imported, in 1898, was as follows:

Name.	Domestic.	Imported.
Buhrstones	\$ 25,934	\$ 22,974
Corundum and emery.....	275,064	133,399
Garnet	86,850	
Grindstones	489,769	62,973
Pulp stone.....	10,619	
Infusorial earth.....	16,619	
Oilstones and whetstones.....	180,486	30,856
Pumice-stone	13,200	
Quartz crystals.....	23,990	
Carborundum	150,000	

The use of buhrstone for millstones for flour-mills has practically ceased.

Some interesting investigations of shell engravings have been made by Dr. F. H. Cushing, of the Bureau of American Ethnology, who finds that the North American Indians employed tools consisting of garnet points attached to a wooden handle.

The increase in the supply of pumice-stone from Nebraska and Utah is gratifying, as hitherto our supply has been entirely derived from Italy.

ABYSSINIA, an African empire lying in the extreme east of the continent, near the Red Sea, from which it is cut off by the Italian territory of Eritrea.

Area and Population.—The area of Abyssinia is about 150,000 square miles, including its dependencies, and its population is estimated at 3,500,000. Great Britain acquired about 8000 square miles of the territory known as British Somaliland by a treaty in 1898, and Italy possesses a strip of land on the coast about 180 miles broad. Abyssinia comprises the provinces of Tigré on the north, Amhara on the south, and Shoa on the southeast, in addition to certain ill-defined dependencies and parts of the Galla and Somali territories. It is made up of high table-lands ranging from 6000 to 10,000 feet above sea level, and broken by chains of mountains and river gorges. The highlands rise abruptly from the low-lying territory along the seacoast, and form a sort of natural fortress which has aided the country in preserving its independence in the past. Of the numerous towns, most of which are of small size, the most important are Gondar, the capital of Amhara; Adua or Adowa, the capital of Tigré; Adis Abeba, the capital of Shoa, and Ankober, the former capital of Shoa.

Racial Characteristics, Religion and Education.—The natives have little in common with the natives of other parts of Africa. They have good physique, with great power of endurance, and are said to make excellent soldiers. Education is not very advanced, and is in the hands of the clergy. The subjects taught are very restricted in their scope. The Abyssinians are still members of the Alexandrian Church, being one of the oldest bodies of Christians in the world. The head of the church, or Abuna, is a Copt, who is consecrated by the Patriarch of Alexandria, but is under the supremacy of a native prelate known as the Echegeheh, and

does not maintain any connection with Egypt, since on leaving that country he is required to take an oath that he will never return.

Production.—It is impossible to procure exact statistics concerning the production and commerce of Abyssinia, but the following facts taken from the United States Consular Reports of August, 1899, may be of interest. The extraordinary fertility of the soil is established beyond question by the reports of recent travelers, and yet large tracts of land lie waste, since the natives of these portions of the country cultivate no more than enough to supply their own wants. It is said that seven-tenths of the uncultivated lands from Harar to the southern boundary of Abyssinia are well adapted to the cultivation of coffee. Cotton is also capable of being produced on a much larger scale than at present, and the native product is of excellent quality. Conditions are favorable for cattle-breeding, and the climate, with its regular rainy season and its variegated surface, makes it possible to raise all kinds of products, including those of both the temperate and tropical zones. The native horses and mules are remarkable for their strength and endurance. Tobacco, olives, and figs grow wild. Honey is produced in great quantities, and is used to make the national drink, known as *tech*, as well as a kind of brandy. Among the other products are hides and skins, eggs, barley, millet, hops, civet, coffee, wax, and ivory. A comparatively small portion of the land is devoted to agriculture, the greater part of the cultivable area being used for pasturage.

Commerce.—The latest figures published in 1899 related to the commerce for 1897-98, and applied only to the city of Harar, but this city being the great commercial centre of the country, and including by far the greatest part of the commercial transactions, its figures give a fair idea of the trade conditions of the country. The chief articles of import in 1897-98 were, in the order of their importance, cotton cloths, arms and military stores, glassware and beads, woollen goods and rugs, food products, and silks. Their aggregate value was \$2,427,265, of which \$1,133,296 represented the value of cotton cloths. The source of these imports was mainly Germany, England, and Austria. They came by way of Bombay and Aden. Of the imports entering the country by the latter route American cottons made up a large part, and it is said that the demand for these goods is rapidly increasing. Germany supplies the greater part of the woollen goods, but rugs are imported from the East and from England and Austria. France, Germany, and Switzerland supply the silks. There is a large sale of arms and munitions, the Gras gun being the favorite, and selling at the rate of from 100,000 to 150,000 a year. The total value of the exports for 1897-98 was \$1,126,155, and the chief item on the list was coffee, which was valued at \$463,200. Next in importance among the exports were gold, ivory, hides, and civet. Of the two grades of coffee sold at Harar one has a small grain like Mocha and the other has a longer berry and is better cultivated. The latter is sold to some extent in England and America. Most of the ivory is paid as tribute to King Menelek, who pays it out, together with gold, for his purchases of arms. Gold is exported in the form of rings and small ingots. The exportation of hides has decreased since 1890 on account of the prevalence of cattle diseases. As to the government's policy in respect to foreign trade, duties are imposed on both exports and imports of merchandise.

Form of Government.—Abyssinia is under a sort of feudal *régime* in which the supreme ruler is King Menelek II., who came to the throne in 1889. The feudal nature of his rule appears in his relations to certain vassal princes. In his relation with his subjects he is essentially an absolute monarch. There is a standing army consisting of about 150,000 men, which is recruited from the various provinces. Besides this there are irregular troops and a territorial army.

History.—Rumors were repeatedly circulated that Menelek was on the point of attacking the English power in Africa. In 1898 one of these rumors had it that Menelek was preparing to aid Major Marchand at Fashoda, and in 1899 that he was about to take advantage of the war in the Transvaal by hostile operations in the Soudan. These reports appear to have come from Italy, where a certain group of politicians had long desired to arouse hostility between England and France, and to this end circulated alarmist rumors in regard to the state of affairs in eastern Africa. These reports caused some anxiety, but appeared to rest on no sound foundation. In 1899 some geographical expeditions were in progress in Abyssinia and in the adjoining territory. One of these was that of the French explorer Lieutenant Blondiaux, whose expedition was officially pronounced to be purely geographical. He had been sent to Raheita, which lies on the west coast of the Red Sea, between the Italian colony of Eritrea and the French colony on the coast of Somaliland. His object was to define the frontier between the French and Italian territories. The matter was settled amicably, Italy obtaining the coast as far as Cape Duneifa and France the portion south of that point. A small island near the cape verging toward the south seemed geographically and politically to belong to France. In England the affair seemed to some writers to indicate an

intention on the part of France to build a fort near the entrance to the Straits of Bab-el-Mandeb, and thus to threaten the neighboring British colony of Perim. There was no proof, however, of any such desire on the part of France. French writers denied any ambitions other than commercial and scientific in this region, and declared that the danger to neighboring territories was not threatened by the policy of France, but rather by that of England. The latter's policy was said by some to menace the integrity of Menelek's empire. English explorers and agents of the intelligence department of the British army of occupation had begun minute investigations on the frontiers of Abyssinia in order to report upon the routes, means of subsistence, nature of the population, and the quantity and value of the arms in this region. In France this course was regarded with suspicion and as indicating a purpose to place the British flag at Adis Abeba.

ACADÉMIE DE MÉDECINE, a French medical society, founded in 1820, has 77 members, and publishes a *Bulletin* and *Memoires*.

ACADÉMIE DES BEAUX ARTS. See INSTITUTE OF FRANCE.

ACADÉMIE DES INSCRIPTIONS ET BELLES-LETTRES. See INSTITUTE OF FRANCE.

ACADÉMIE DES SCIENCES. See INSTITUTE OF FRANCE.

ACADÉMIE DES SCIENCES, MORALES ET POLITIQUES. See INSTITUTE OF FRANCE.

ACADÉMIE FRANÇAISE (French Academy), founded in 1629, by Cardinal Richelieu, consists of 40 members (the "forty immortals") and meets at the Palais de l'Institut every Thursday. The members now, with the dates of their election, are: Legouvé, 1855; Duc de Broglie, 1862; Emile Ollivier, 1870; Alfred Mézières, 1874; Gaston Boissier, 1876; V. Sardou, 1877; Duc d'Audiffret Pasquier, 1878; Rousse, 1880; Sully-Prudhomme, 1881; Perraud, 1882; E. Pailleron, 1882; F. Coppée, 1884; Joseph Bertrand, 1884; Halévy, 1884; V. Gérard, 1886; Comte d'Haussonville, 1886; Jules Clarétie, 1888; Melchior de Vogüé, 1888; De Freycinet, 1890; J. Viaud (Pierre Loti), 1891; E. Lavisse, 1892; Dangin, 1893; H. de Bornier, 1893; Brunetière, 1893; A. Sorel, 1894; Paul Bourget, 1894; De Hérédia, 1894; H. Hous-saye, 1895; J. Lemaitre, 1895; Anatole France, 1896; Marquis Costa de Beauregard, 1896; Gaston Paris, 1896; Theuriet, 1896; Vandal, 1896; Hanotaux, 1897; De Mun, 1897; E. Guillaume, 1898; Lavedan, 1899; Deschanel, 1899. MM. Cherbuliez and Hervé died in 1899. The fortieth chair was vacant in 1899. Secretary, Gaston Boissier.

Twenty-one "*prix littéraires*" and forty "*prix de vertu*" are awarded by the academy annually. Six members are appointed as a Dictionary Commission.

ACADEMY OF MEDICINE, AMERICAN, is a society formed for the purpose of investigating the sociological problems of the medical profession and for putting in practice the results of its investigations. Its researches are strictly scientific. It has 874 members and 20 honorary members. Officers: President, G. Hudson Makuen, M.D., Philadelphia, Penn.; secretary, Charles McIntire, M.D., Easton, Penn.

ACADEMY OF POLITICAL AND SOCIAL SCIENCE, AMERICAN. See POLITICAL AND SOCIAL SCIENCE, AMERICAN ACADEMY OF.

ACADEMY OF SCIENCES (LISBON), founded in 1775, has sections devoted to mathematics, physics, natural history, literature, ethics, politics, history and archaeology, each section having five active besides corresponding members. The Academy has a large library and publishes *Jornal de Sciencias*, etc., and *Memorias*.

ACADEMY OF SCIENCES (MUNICH, KÖNIGLICHE BAYRISCHE AKADEMIE DER WISSENSCHAFTEN UND GENERALKONSERVATORIUM) was founded in 1759, and has three sections—one devoted to philosophy and philology, another to mathematics and physics, the third to history; publishes *Denkschriften* and *Abhandlungen*.

ACETYLENE. See GAS, ETC., and CALCIUM CARBIDE.

ACHENBACH, HEINRICH VON, Prussian statesman, died July 10, 1899. He was born at Saarbrücken November 23, 1829; he studied law in Bonn and Berlin, and in 1858 was appointed a lecturer on German law in Bonn, and in 1860 was made professor. In the same year he founded the *Zeitschrift für Bergrecht*, a journal on mining and mining laws, which he conducted for fourteen years. Meanwhile, he entered politics, was a member of the Superior Council of Mines, and was appointed in 1866 mining counsellor in the Ministry of Commerce. In 1870 he was appointed to the Federal Chancery. In 1872 he was called by Falk, the minister of ecclesiastical affairs, to be under secretary of state, and while in this position he bore a prominent part in the struggle which took place in the *Landtag* between church and state. In May, 1873, he became minister of commerce, industry, and

public works, and in the following year took charge also of the Department of Agriculture. Achenbach was active in railroad discussion, and largely through his influence the *Reichstag* made appropriations for the purchase of the German railroads. In 1874 he became Prussian representative in the Imperial Federal Council. He was appointed in March, 1878, to the governorship of the province of West Prussia, and in February, 1879, became governor of Brandenburg; he retained the latter position to the time of his death. In 1888 he was raised to the nobility. Besides several works on the history of the principality of Siegen, Achenbach wrote a few volumes on jurisprudence, including *Das französische Bergrecht und die Fortbildung desselben durch das preussische allgemeine Bergesetz* (1869) and *Das gemeine deutsche Bergrecht* (1871).

ACOIN. This new local anæsthetic is a derivative of guanin, and appears as a white powder soluble in water in the proportion of $4\frac{1}{2}$ grains to the ounce. Guanin occurs in the form of a white powder or a crystalline substance, and is obtained from guano, from the scales of certain fishes, from the excrement of spiders, and is occasionally found in the human liver, pancreas, and spleen. Acoin is distinctly less toxic than cocaine, and does not act as quickly. Randolph has used it during the year 1899 in various operations on the eye. He has published in the *Ophthalmic Record* the following conclusions: 1. Acoin in solutions of 1:100 and 1:300 produces satisfactory anæsthesia in an unirritated eye in about the same length of time as cocaine. 2. In more than one case where the eye was congested repeated instillations of acoin were inadequate to produce anæsthesia. 3. Inspection of the cornea with high-power lens failed to show any defects in the epithelium after its use. 4. Acoin has no effect on accommodation. 5. Acoin does not increase intraocular tension. 6. Several experiments indicated that acoin was not only an inhibitor of the growth of staphylococcus albus, but that it also killed this organism after a certain length of time.

ACTORS FUND OF AMERICA, a charitable institution formed in 1882. Disbursements last fiscal year, \$32,772; since organization, \$610,986. In 1899 there were 755 members. President, Louis Aldrich; Secretary, Edwin Knowles; Assistant Secretary, B. A. Reinhold, 12 West Twenty-eighth Street, New York City.

ACTUARIAL SOCIETY OF AMERICA, organized in 1889 for the promotion of the science of life insurance, held its decennial meeting May 18, 1899. During the ten years twenty meetings were held, twenty numbers of *Papers and Transactions* were published, a library of considerable size was accumulated, and the membership, notwithstanding the losses, steadily increased. Present membership, 112. President, Thomas B. Macaulay; Secretary, John Tatlock, Jr., 141 Broadway, New York.

ADAMS, Colonel JULIUS WALKER, died December 13, 1899, at the age of 87 years. As a civil engineer he was identified with the origin and construction of the New York and Brooklyn suspension bridge, having been one of the first engineers who conceived the idea of building it, and having held various positions in connection with the early part of its construction. His scientific knowledge was acquired at West Point, which institution he left to become the assistant engineer of the Providence and Stonington Railroad. He was the chief engineer in the building of several bridges and railroads, and was consulting engineer, at different times, to the Wallabout Commission and to the Brooklyn Board of City Works, and in connection with water distribution in New York City. He served also as consulting or chief engineer on government and army constructions. As colonel, he commanded the Hawkins Zouaves in the Civil War; during the New York riot he commanded the troops at Printing House Square.

ADEN, a territory in southwestern Arabia, about 110 miles east of the Straits of Babel-Mandeb. It comprises, besides the volcanic peninsula of Aden proper, a smaller peninsula known as Little Aden, and a town and three small villages on the mainland, together with the adjacent island of Perim. The area, including Perim, is 80 square miles, and the population in 1891 was 41,910. The town of Aden is well fortified and has a fine harbor. It is an important coaling station on the route to the East. The territory is a dependency of Great Britain, and under the government of Bombay. It is directly administered by a political resident who is both military and civil governor. Its chief importance is commercial. Among its articles of trade are coffee, gums, hides and skins, piece goods, tobacco, and cotton twist. It serves as a collecting point of exports from Somaliland and part of Abyssinia, and as the distributing centre for articles imported to that region. It is the place of transshipment for goods destined for steamship transit to Zeila and Berbera, from which points they are carried into the interior of Africa by camels. It was reported in 1899 that the entire import trade by sea during the year was \$11,722,223, of which cotton goods was the most important part.

ADULTERATION. See **FOODS.**

ADVANCEMENT OF SCIENCE, AMERICAN ASSOCIATION FOR THE, organized in 1848, had in 1899 a membership of 1725. President, Grove K. Gilbert; permanent secretary, L. O. Howard, Cosmos Club, Washington, D. C. General meeting for 1900 in New York, June 23-30. The association publishes annual *Proceedings*.

ADVENTISTS. The name of six religious sects, specifically distinguished as follows: (1) The Evangelical, with (in 1899) 34 ministers, 30 churches, and 1147 communicants; (2) the Advent Christians, with 912 ministers, 610 churches, and 26,500 communicants; (3) the Seventh-Day Adventists (see below); (4) the Church of God, with 19 ministers, 29 churches, and 647 members; (5) the Life and Advent Union, with 60 ministers, 33 churches, and 3000 communicants, and (6) the Churches of God in Jesus Christ, with 94 ministers, 95 churches, and 2872 communicants.

ADVENTISTS, SEVENTH-DAY, organized about 1844, held in 1899 a biennial conference at South Lancaster, Mass., delegates attending from many countries in all parts of the world, and a conference of the Australasian Union was held at Cooranbong, New South Wales. A conference was organized in the Province of Ontario in June, and includes 7 churches and about 500 members. In 1898-99 there was an increase of 110 ordained ministers, 23 licentiates, 215 churches, and 7245 members, and an increase of tithe of \$90,000; making in 1899 a total of 372 ministers, 1470 churches, and 55,316 members. The latest report of the Commissioner of Education (1899) shows the Seventh-Day Adventists to have 3 institutions of learning, with 31 professors and 223 students.

AERIAL NAVIGATION is now attempted with machines belonging to two systems. The one system, ballooning, requires apparatus lighter than the air; the other, aviation, or an imitation of bird motion, necessarily uses machines heavier than the air. The greatest objection to the balloon is the difficulty, not to say impossibility, of steering it properly; while the great difficulty with a machine heavier than the air, of course, is keeping it afloat. It should be remarked that some of the more recent air-ships, such as the Zeppelin machine described below, make use both of gas expansion and of mechanical steering and propelling appliances.

A flying-machine, also combining the principle of the balloon with aviation, has been devised by Dr. Danilevsky, of Charkov, Russia, and with it, as early as the fall of 1897, several ascents, successful, though of short duration, were made. It attracted the attention of the United States government, which has appropriated \$25,000 for experiments relating thereto.

In September, 1898, an air-ship, invented by M. De Santos-Dumont, of Paris, and consisting of a cylindrical balloon and a basket with a steering apparatus and a two-bladed aluminium propeller operated by a motor, made a fairly successful ascent and journey in Paris. The balloon and basket weigh about 154 pounds, and the motor and screw about 176 pounds.

Early in 1899 it was announced that Mr. Hargrave, the kite-flying expert, had invented a "soaring apparatus based on his discovery that the cup-shape of the under side of a bird's wings causes an air vortex to form in flight and propel the bird against the wind in long-sustained soaring."

In September, 1899, a French aeronaut, M. Hernite, travelled in a balloon from St. Denis to the mouth of the Rhone in fifteen hours. The speed accordingly was as fast as an express train.

Also in the fall of 1899 a description was published of a flying-machine invented by M. Feodoroff, who claimed that his invention was thoroughly successful. The propelling power is derived from the combustion of gas, which is generated from liquids stored in reservoirs on the machine. There is said to be no danger of fire, since the car is separated by incombustible materials from the apparatus, which is built wholly of metal. The car is designed to hold one person, and the possible speed claimed for the machine is from 140 to 160 kilometres (87 to 99 miles) an hour.

The Zeppelin Air-Ship.—The most noteworthy attempt at aerial navigation in 1899 was the great dirigible balloon, devised by Count von Zeppelin, which was in process of construction during the year. The motive force, which is a benzine engine, was expected to drive the ship in calm weather at a rate of twenty-two miles an hour. Near the end of the year the cost had amounted to almost \$350,000. Still incomplete at the close of the year, it was housed in an immense floating structure on Lake Constance. The following description is a condensed translation from *Ueber Land und Meer*, appearing in the *Scientific American Supplement* for November 11, 1899:

"The air-ship now in the course of erection within this structure is 410 feet long.

The supporting body is a cylinder 39 feet in diameter, the ends being tapered so as to offer the least possible resistance to the air. The skeleton frame of this cylinder is composed of aluminium. Sixteen rings separated from one another 26 feet hold the framework together. These rings are not circular, but form a twenty-four-sided polygon; their shape is determined by numerous strong aluminium wires radiating from a central circle like the spokes of a bicycle wheel. Horizontal bars are used to hold the rings together. The entire framework will be surrounded by a netting of ramie-fibre cord, remarkable for its great toughness and tensile strength. Within the framework and on each side of the rings a similar netting will be disposed.

"The sixteen rings divide the cylinder into seventeen compartments, as it were, each of which will contain a balloon or gas-bag. If one of these seventeen independent balloons be injured, the others will remain intact and will still support the air-ship. The principle evidently resembles that of the water-tight compartments of a steamship. But the system is far safer than that employed in vessels, for no connecting doors or openings are used.

"The balloons are made of a light, but tough and impenetrable, cotton fabric covered with a gas-tight rubber composition. The aluminium framework is still further protected by an outer water-tight envelope which serves chiefly to protect the balloons from the direct rays of the sun and from rain. The ramie netting serves the purpose of separating the balloons from one another and from the outer envelope.

"The balloons will have a capacity of 351,150 cubic feet, and will be filled with hydrogen gas kept under pressure in cast-iron cylinders, each of which contains 175 cubic feet. Two thousand cylinders will, therefore, be required. The cylinders will be stored on a float which will be towed to the housing when the balloons are to be inflated."

"Every moving body, such as a ship or bicycle, can be steered. That it has hitherto been impossible to direct an air-ship is due partly to the form adopted in the construction, partly to insufficient motive power and inadequate steering appliances. Count von Zeppelin claims to have remedied all these faults. He will drive his air-ship backward or forward by four aluminium propellers, a pair of which will be mounted at each end of the cylindrical body, somewhat below the central axis. The ship will be steered by rudders placed at the front and rear ends.

"Rigidly connected with the balloon cylinder are two aluminium cars, each located beneath a pair of propellers. These cars are 21.32 feet long, 5.96 feet wide, 3.28 feet high, and taper from top to bottom. Beneath the bottom of each car are wheels provided with coiled springs which deaden the shock when the air-ship strikes the ground and set the wheels in motion. In each car is a benzine motor, developing from 12 to 15 indicated horse-power, by means of which the propellers are driven. The connection between the propellers and the motors consists of gearing and of driving-shafts passing through Mannesmann seamless steel tubes. Variations in the position of the framework can be compensated for by means of two movable joint couplings.

"Benzine is the most suitable motive power for aerial navigation. Electricity can not be used, for the necessary accumulators are far too heavy. Hydrocarbon vapors, to be sure, are highly inflammable, and their use in air-ships provided with gas-bags is therefore attended with much danger. But the benzine motors in the present instance have been so carefully constructed that there is no danger of fire. Moreover, the lower side of the balloon-cylinder immediately above the cars has been covered with fireproof material. The cars are connected by a passage two feet wide which rest on T-rails and which are tied together with aluminium wire. The crew of five men can thus pass from one car to the other. Beneath the cars and connecting passage a cable is loosely suspended, to which a sliding weight is secured. By adjusting the position of the weight the ends of the ship can be raised or lowered. When the weight is shifted to the rear, the forward end of the air-ship is raised, and the air pressing on the under surface, as in a kite, will force the vessel upward. When the weight is shifted to the front, the rear end is elevated, and the ship will descend owing to the pressure of the air on its upper surface.

"The first trials of the ship are soon to be made. The supporting cylindrical body is almost completed; and only the pointed ends are still to be placed in position. The cars, motors, propellers, and accessory apparatus will be shipped to the housing ready to be mounted, an operation which will require but a few days."

AFGHANISTAN lies in Central Asia to the south of the Central Asian states under Russian influence. Persia bounds it on the west and the British political agency of Baluchistan on the south. It has an area variously estimated at from 215,400 square miles to about 300,000 square miles and a population estimated at 4,000,000, though some authorities place it as high as 16,000,000. The boundaries on the east and south were long unsettled, but an agreement between England and

Afghanistan in 1893 fixed a basis upon which the delimitation of the frontier was subsequently carried out. As a result of this delimitation, Chitral, Swat, Bajaur, and Chilas were recognized by the Ameer as within the sphere of British influence. There were contested claims to Kafiristan and Waziristan, but these were settled by recognizing the former as under Afghan control and the latter as under British. The country is occupied by a variety of tribes, of which the most numerous are the Ghilzais, who number about 1,000,000. Other tribes are the Tajiks, Hazaras, Duranis, Aimaks, and Uzbeks. A large part of the population is nomadic, but the Tajiks practise agriculture and industry to some extent. The religion of most of the natives is Mohammedan, and they belong to the Suni sect. The chief products are horses, spices, asafetida, fruits, and nuts, which are exported to India. The chief imports are cotton goods, indigo, sugar, and tea. The trade is mainly between Cabul, Candahar, and India, but of late years the trade between Cabul and India has considerably declined. While the exports consist chiefly of the products mentioned, the country produces wheat, barley, peas, beans, rice, millet, arzun, Indian corn, and a great variety of fruits. The latter are especially abundant and are the chief article of food for a large portion of the people. Copper veins are said to exist in the north of Afghanistan, and iron, gold, and precious stones in other parts of the country. The chief industries are the silk manufacture and the manufacture of felts, carpets, postins, and rosaries. The ruler or Ameer is Abdurrahman, who was recognized by the British Government in July, 1880. The regular army, which is based on European models, is said to number on a war footing about 50,000 men, and in addition to this there are local levies of infantry and cavalry. There is an arsenal at Cabul under the superintendence of Englishmen in the Ameer's service which manufactures cannon, rifles, and ammunition.

Afghan Question.—By the treaty of Paris, which closed the war with Persia, England declared that she regarded Afghanistan as the "outwork" of India, and as lying outside the sphere of Russian influence. The expansion of Russia in Central Asia has raised a serious question, since it has seemed likely that the assertion of Russian influence in Afghanistan would threaten England's political supremacy in India. As the result of an agreement, reached in 1893, a boundary commission delimited the Afghan frontier, but this has not been regarded as a final settlement of the difficulty, since Russia has at no time committed herself to non-interference with Afghanistan, although certain of her diplomats have expressed the opinion that Afghanistan was outside the sphere of Russian influence. England can cite no express declaration on the part of Russia that she would not invade Afghanistan, and there was nothing in the boundary agreement to make it unjustifiable for her to assert her influence beyond the frontier. Thus there has been no positive sign that Russia acquiesced in the English view that Afghanistan was not an independent country, but a dependency of India. In 1899 the two main objects of Russian policy in Central Asia were to secure a free port on the Persian Gulf, and to have an accredited Russian representative at Cabul, the capital of Afghanistan. As to the former request, it was generally supposed that England would offer no objection, provided counterbalancing advantages could be secured for her somewhere else. A free outlet to the ocean in western Asia seemed to be a reasonable demand on the part of Russia and to make for progress in that region. But it was clear that this desire of Russia's was not concerned solely with trade development, but had in view the securing of an important strategic point, and in England it was urged that should this be granted the English government should insist on keeping open Bushire as a free port and of reserving a portion of its "hinterland" as a British sphere. In other words, the granting of the demand was to be conditioned upon the obtaining of a fair equivalent. As to the second point, the maintenance of an accredited Russian representative at the Ameer's capital, some serious objections were advanced against it. It was said that upon the death of the present Ameer, Abdurrahman, who had proved himself able to inspire the respect and fear of his subjects, there would be no security for envoys at the Afghan capital. Again, it seemed likely that upon the death of the Ameer there would be a war of succession and that the maintenance of Afghan integrity would be a matter of extreme difficulty. For many years the British government, through the Viceroy of India, has paid an annual subsidy to the Ameer to aid him in maintaining his position and to reward him for conforming his foreign policy to the wishes of Great Britain. To give his country an international status would result in complicating the matter and would abandon the advantages for which England's money had been paid. Russia requested that Europe should be represented in the Afghan capital, and there were signs that the French sympathized in this desire. The Ameer himself was naturally favorable to such a change of status as would seem to place him on a par with the great European powers. It had long been a special object of his ambition to treat directly with London instead of through the Indian Viceroy. These subjects appear to have been discussed in diplomatic correspondence between

Russia and Great Britain in 1899, but there was no settlement of the questions involved down to the close of that year.

AFRICA has an area of nearly 12,000,000 square miles, some authorities placing it at 11,874,600 square miles, and others at 11,908,100 square miles. While several powers have long possessed portions of Africa, it is only within recent years that the territory has been extensively partitioned. It was not, in fact, until September, 1884, that the contest for African lands was actively begun. That was the year when Germany entered the competition and when the Berlin conference prescribed the rules which should govern the acquisition of African territory. At the present time the territory of Africa is divided among the following powers, either in the form of actual colonies or as dependencies and protectorates: France, Great Britain, Germany, Portugal, Italy, Spain, Turkey. Besides the possessions of these powers there are six independent States—namely, Morocco, Liberia, Abyssinia, the Orange Free State, the Transvaal Republic, and the Congo Free State, although the last named is administered by the Belgian King. The tie binding Egypt to Turkey is a loose one, and Egypt may be reckoned among the territories that are under British influence. The following list gives the names of the different divisions, classified according to the country which possesses them or exercises a controlling influence over them:

INDEPENDENT STATES.....	{	Abyssinia.
		Congo Free State.
		Liberia.
		Morocco.
		Orange Free State.
		Tripoli.
BRITISH.....	{	Ascension Island.
		Basutoland.
		Bechuanaland Protectorate.
		Cape Colony.
		Central Africa (British).
		Central Africa Protectorate (British).
		Mashonaland.
		Matabeleland.
		East Africa (British).
		Zanzibar.
		Mauritius.
		Natal.
		Niger Coast Protectorate.
		Niger Territories.
		St. Helena.
		Tristan da Cunha.
		Gold Coast.
UNDER BRITISH INFLUENCE.	{	Lagos.
		Gambia.
		Sierra Leone.
		Somali Coast Protectorate.
		Uganda.
		Walvisch Bay.
		Zululand.
		Egypt.
		The Egyptian Soudan.
		Transvaal.
FRENCH.....	{	Algeria.
		French Congo.
		French Guinea.
		Madagascar.
		Diego-Suarez, Nossi-Bé, and St. Marie.
		Mayotte and the Comoro Island.
		Réunion.
		Obock.
		Senegal.
		French Soudan.
GERMAN.....	{	Dahomey.
		Tunis.
		Cameroon.
		German East Africa.
		German Southwest Africa.
		Togoland.

ITALIAN.....	{ Eritrea. Somaliland.
PORTUGUESE.....	{ Angola. Cape Verde Islands. Guinea. Portuguese East Africa.

The Partition of Africa.—According to the figures published by the Secretary of the Royal Geographical Society in 1898, the principal shares of European States in the lands of Africa were as follows:

France.....	3,300,000	square miles
Great Britain.....	2,300,000	" "
Germany	925,000	" "
Congo Free State (Belgium).....	900,000	" "
Portugal	750,000	" "
Italy (including Somaliland).....	420,000	" "

Figures based on more recent statistics and published by the United States Bureau of Statistics in 1899 give the following distribution of area:

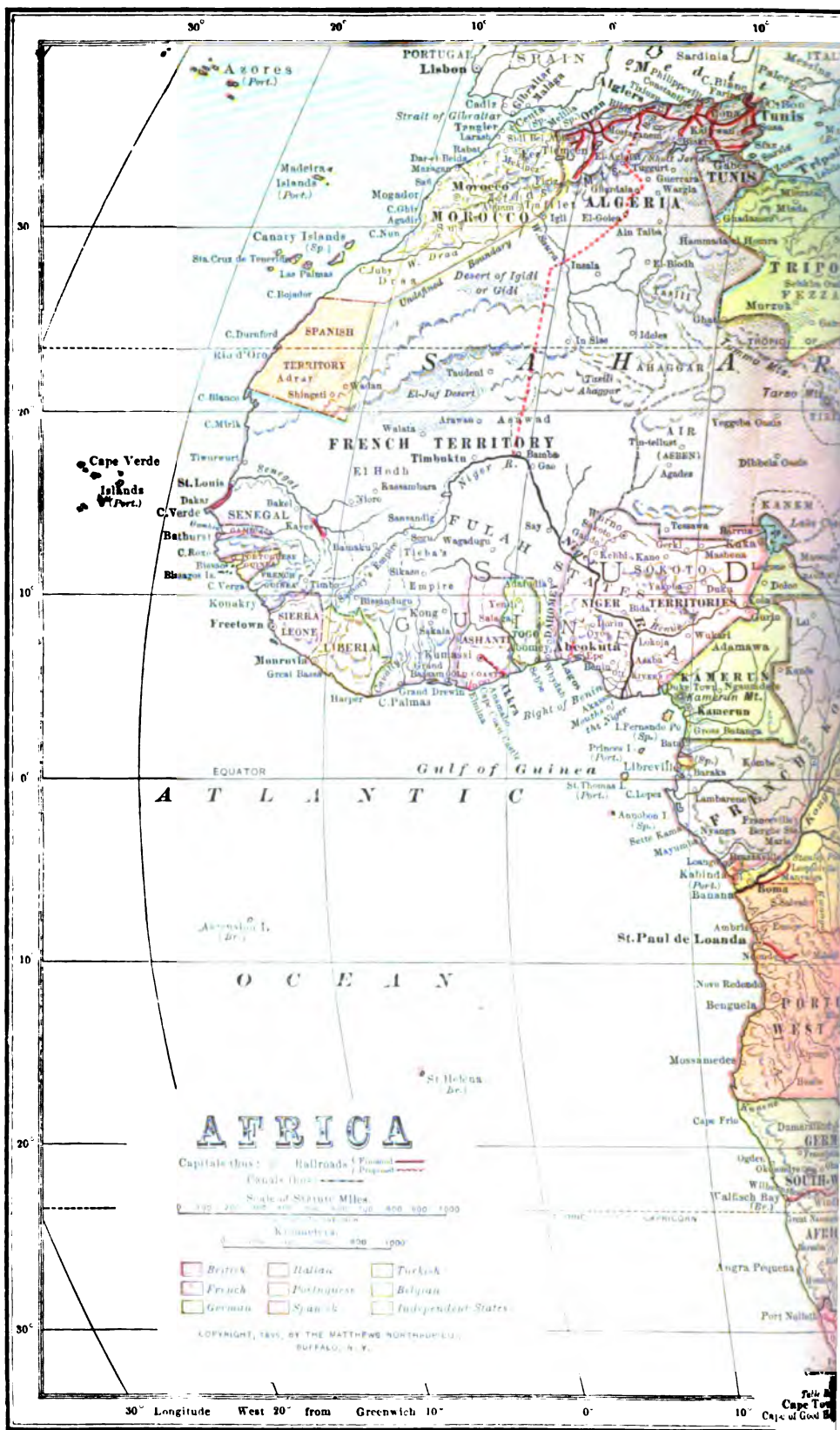
Great Britain.....	2,761,195	square miles
France	3,027,420	" "
Germany	944,130	" "
Portugal	790,240	" "
Egypt and Soudan.....	1,350,000	" "
Tripoli	400,000	" "
Italy	188,500	" "
Spain	243,000	" "
Congo Free State.....	900,000	" "
Morocco	219,000	" "
Liberia	48,000	" "
Abyssinia	150,000	" "
Transvaal	119,139	" "
Orange Free State.....	48,326	" "

Population.—The estimates of population are very vague and range all the way from 125,000,000 to 175,000,000, but it may be safely stated that the population of Africa is about twice that of the United States. The population is marked by the great diversity of language and racial character, and this fact has retarded the opening up of the country to Europeans. The northern portion—that is, the territory lying north of latitude 10° north—is largely Mohammedan and hostile to Europeans. In parts of this region the slave trade has been followed, and the disorders which it has caused have proved another bar to the peaceful developments of the country. The chief races in the north may be divided into the three groups of Soudanese, consisting of negroes, pure and mixed; Hamitic, comprising Berbers, Egyptians, and Ethiopians; and Semitic, comprising Arabs and Abyssinians. The negroes are divided into hundreds of linguistic groups and show little affinity to one another beyond rough external resemblance. In the south, where the Bantu language prevails, the population is more homogeneous, but here again the warlike character of many of the tribes has retarded European settlement. In physique the Bantu inhabitants of the south greatly surpass the races of Northern Africa, and have frequently proven their military power in contests with the Europeans and with one another.

Physical Features.—The extreme length of the continent is about 5000 miles and the breadth 4000. The coast is comparatively free from indentations, and there are few water routes into the interior. This has presented an obstacle to exploration, which has been increased by the fact that the interior consists in large part of high table-lands, and that the few rivers which derive their sources from the interior have rapids which obstruct navigation. The chief navigable rivers are the Congo, Niger, Senegal, and Gambia on the west; the Limpopo, Zambesi, Juba, and Umba on the southeast and east, and the Nile on the north. The Congo is navigable for a distance of about 2000 miles, but the rapids begin about 100 miles from the mouth, and in order to secure access to the long course of navigable waters in the interior, it is necessary to transport the steamers over the intervening distance. Small steamers are carried in sections from this point to the navigable waters, but the construction of a railway for a distance of 250 miles above the falls has permitted the transportation of larger vessels. As a result the Congo valley has developed rapidly, and instead of the few natural products that were formerly raised

there, coffee and cacao fields planted since 1891 yield valuable crops for the export trade. The Zambesi, which formerly could not be navigated on account of the shallow waters in the delta, has been opened up to navigation since 1887, and steamers penetrate about 600 miles inland, and the navigable distance is being increased by the construction of a railway around some of the rapids. The Niger, though navigable for a considerable distance from its mouth, is also interrupted by rapids, but the completion of certain railway projects now in hand will, it is said, open the river to navigation for a distance of about 1000 miles. The navigation of the Nile has been secured by the same method of constructing railways around the rapids, and now light-draught steamers penetrate into the heart of the continent, reaching a region not far distant from the navigable waters of the Congo. The other streams mentioned are navigable for a short distance from the coast. The lakes of the interior have already been opened to steam navigation. In addition to the difficulty of exploration caused by the comparatively small number of these water routes, inland travel has been impeded by the vast reaches of desert land in the north. This tract extends from the western coast to the region of the Upper Nile, and in the west is known as the Sahara, and in the east as the Libyan Desert. The desert land of the Sahara—that is, the portion of it which is unfit for grazing or for agriculture—has an estimated area of 2,400,000 square miles, and nearly one-fifth of this is covered by shifting sands. There are many difficulties in the way of travel through this region, especially in the central zone, which has a width of from 150 to 200 miles. The population of the Sahara is estimated at 100,000, and consists in the east chiefly of the Tuareg and Tibbu tribes, and in the west of Moors, Arabs, Berbers, and people of mixed negro race. The Soudan—that is, the region lying south of the Sahara, and extending from the Atlantic coast to the Red Sea and the Congo basin—has presented another obstacle to settlement in the frequent conflicts of its turbulent population. The Mohammedan slave dealers have been chiefly responsible for these conflicts. The chief element in the population is the negro.

The British Colonies in Africa.—Great Britain has her strongest hold in the southern and eastern parts of the continent. From Cape Town in the south to Lake Tanganyika—that is, for a distance of 1800 miles—her territory extends in an unbroken line, though narrowed here and there by the indentations of neighboring states. This territory is bounded on the west by German Southwest Africa, Portuguese Angola, and the Congo Free State, and on the east by Portuguese East Africa and German East Africa. The Orange Free State, which lies to the north of Cape Colony, is surrounded on three sides by British territory, and north of the Orange Free State is the other Boer republic, the Transvaal. At the beginning of 1899 the boundaries of the British territories in this region were all settled. They comprised an estimated area of 1,000,000 square miles, and in respect to their political status, ranged from well-established and self-governing colonies like Cape Colony to mere spheres of influence. If the "Cape to Cairo" railway is carried out, the line will not meet territory outside of British control until it has been completed to the southern end of Lake Tanganyika. Six hundred miles would then have to be passed before reaching British territory again, but two-thirds of this distance is taken up by Lake Tanganyika, whose waters are navigable to the states upon which it borders. This would leave only about two hundred miles of foreign territory to be traversed before the southern boundary of British East Africa was reached. From this point the British territory stretches continuously to the boundary of Egypt, which country itself is under British control. Beginning with the southernmost point, the British possessions which form the length of this almost unbroken chain stretching from Cape to Cairo are Cape Colony, British Bechuanaland, British South Africa, and British Central Africa; then comes the colony of German East Africa, north of which lies British East Africa. The southern part of this forms the dependent kingdom of Uganda, and the northwestern part extends to Bahr-el-Ghazal, which was the subject of dispute in 1898 and 1899 and to which France abandoned all claim by the Anglo-French convention of March 21, 1899. (See FRANCE.) To the north and east of this territory lie the other provinces of the Soudan regained for Egypt by the Kitchener expedition of 1898, and extending to the boundary of Egypt, which is under British influence. Besides this almost continuous tract, which is either in actual possession of Great Britain or under her control, the British possessions include the islands of Zanzibar and Pemba, together with a considerable tract on the eastern coast fronting on the Gulf of Aden, and commanding the entrance to the Red Sea. There is no such continuity of British territory on the western coast, where the chief British possession is the great block of land known as Nigeria, or the Niger territories, at the head of the Gulf of Guinea, and between the 5th and 15th degrees of north latitude. The boundaries of the Niger territories were defined by agreement with France and Germany, and with the native princes, the most recent dispute, that between





France and Germany, having been settled in August, 1898. The other British lands in this region are the district of Lagos and the Gold Coast, Sierra Leone and Gambia. The total population of the British possessions in Africa has recently been estimated at about 30,000,000, and, including Egypt, at about 50,000,000.

The French Possessions.—The area of the French territory in Africa surpasses that of any other power, but is inferior to the British possessions both in respect to natural resources and in respect to population. The greater part of the Sahara region was recognized as French by the agreement with England in 1890. In the north, on the coast of the Mediterranean, are her dependencies of Algeria and Tunis, to which her claims, established by right of conquest, seemed not to be disputed. South of these lies the enormous tract which stretches southeast as far as the western boundaries of the Egyptian provinces of the Soudan and the northern boundary of Nigeria, and west to the Atlantic Ocean. Passing along the western coast the French territory is indented by the independent principality of Morocco, the Spanish territory of Rio d'Oro, British Gambia, Portuguese Guinea, British Sierra Leone, the independent state of Liberia, the British Gold Coast, German Togoland, and British Nigeria. Another great division belonging to France is French Congo, which extends from the western coast of Africa and joins the French Sahara region in the interior, thus making French territory continuous from the southwest coast of Africa to the shore of the Mediterranean. Despite the large proportion of the French territory occupied by the Desert of Sahara, her possessions are most valuable. They include almost the entire length of the Senegal River, which is navigable for about 500 miles, and more than half the length of the Niger, the third largest river in the continent. It has been said that France cherished the ambition of carrying her territories eastward across the entire continent in spite of the claims of Great Britain on the Upper Nile. The Anglo-French agreement of March 21, 1899, arising out of the Fashoda dispute, put an end to this project, if it really existed. This convention determined the boundaries between the "hinterland" of the French Congo and the Egyptian provinces of the Soudan. On the eastern coast France possesses the important island of Madagascar, and a small wedge of territory called Obok, or Obok, opposite the British possession of Aden. The population of the territories possessed by France show great racial diversity. In the extreme north are the Moors and Berbers, and in the south a numerous population of the Negritos. The Moors and Berbers are Mohammedan in religion, and yield themselves slowly to civilization. The savage practices of the negritic tribes, together with the disorders arising from slave traffic, have absorbed the energies of the French and retarded commercial development. The French colonies, as a rule, have not reached the stage of peaceful settlement and economic development.

German Possessions.—Since the acquisition of Damaraland and Namaqualand on the southwestern coast, Germany has rapidly extended her African possessions. She now holds about 1,000,000 square miles, with an estimated population of 10,000,000. Her chief possessions are Togoland, Cameroon, German Southwest Africa, and German East Africa. The last named is her most valuable territory. It is bounded on the north by British East Africa, on the west by Congo Free State and British Central Africa, and on the south by Portuguese East Africa. Lying on the coast and having Lake Tanganyika on its western boundary, Lake Victoria Nyanza on its northern, and Lake Nyassa on the southwestern, it has access to water in any direction. While the German territories are rich in natural resources and show every variety of climate, they are still in a backward state. The European element in the population is very small, and commercial development is slow.

Portuguese Possessions.—Portugal, though the oldest sharer in African lands, has now only the large block of territory called Angola, on the west coast, the strip of land extending to the north and south of the Zambesi on the east coast, and the small colony of Portuguese Guinea on the western coast, lying to the north of French Guinea. Her eastern and western territories extend inland to a distance of about 600 miles from each other. Railway construction has made considerable progress, but in general the Portuguese have shown little enterprise in the development of their colonies.

The Congo Free State.—The Congo Free State lies in Equatorial Africa, and occupies the basin of the great Congo River. It was established by the Berlin Congress of 1884-85, which recognized its rank as a sovereign state. Since that date treaties with the European powers have recognized its sovereignty. The King of the Belgians, under whose sovereignty it was placed by the conference of Berlin, ceded his rights to Belgium. It has an area of 900,000 square miles, with a population of about 30,000,000.

Italian Possessions.—The Italian colonies of Africa are on the eastern coast, and include Eritrea, with an area of about 88,500 square miles, and the protectorate of the Somali coast, with an estimated area of 100,000 square miles. Italy's forward

policy in Africa dates from 1882, when she began to extend her claims northward along the Red Sea, but the adoption of an aggressive policy toward Abyssinia after 1888 resulted in the failure of her projects. After the defeat of Adowa, in 1896, she recognized the independence of Abyssinia, and submitted to a restriction of territory far below what she had formerly claimed. Eritrea, while not a flourishing colony, is fairly rich in pastoral products. It is under a civil governor appointed by the king, and responsible directly to the Italian minister of foreign affairs. The larger territory known as the Somali Coast Protectorate is still undeveloped, and the government is for the most part conducted by native chiefs.

Spanish Possessions.—To Spain belongs the comparatively unimportant territory of Rio d'Oro, with an area of about 243,000 square miles, and a population estimated at 100,000. Spain also claims a district on the river Muni, but the claim is contested by France. In addition to the Rio d'Oro, Spain has the Canary Islands, Tetuan in Morocco, and a few other small tracts, which comprise an area of about 3800 square miles.

Other States.—Egypt, whose status is more properly discussed in the article on Egypt, has an estimated area of 400,000 square miles, while the provinces of the Soudan, which have recently been regained for her, have an area of about 800,000 square miles. Though sometimes classified under the head of Turkish Africa, Egypt and the Egyptian Soudan are but loosely connected with Turkey, except that the Egyptian government pays a fixed revenue to the Porte. To the west of Egypt lie the Turkish possessions of Tripoli and Fezzan. The independent states are Morocco, Liberia, Orange Free State, the Transvaal or South African Republic, and Abyssinia.

Products.—In a continent which covers an area of nearly 12,000,000 square miles, there is naturally a great variety of products. In the north the products include a great variety of fruits and cereals which are appropriate to temperate and semi-tropical climates. Among them are wheat, barley, corn, rice, sugar, cotton, tropical fruits, and wines. In the zone lying nearer to the equator the natural products, which are largely exported, include ivory, palm nuts, palm oil, rubber, etc., and the cultivation of coffee, tobacco, cocoa, and other staples have recently been introduced. The products of a temperate climate are raised in the south, and include not only cereals, but cattle, goats, sheep, and horses, but the main source of wealth in Africa is the mines, especially the diamond and gold mines. The Kimberley mines, which were opened in 1868-69, are situated about 600 miles north of Cape Town, in Cape Colony, near the border of the Orange Free State. It is estimated that since their opening the value of the uncut diamonds produced is \$350,000,000. The great facilities for diamond mining in this district have resulted in a concentration of the industry at this point, so that about 98 per cent. of the diamond production of the world is from these mines. The centre of gold production is the Witwatersrand, a long, narrow strip of land in the Transvaal. Other gold mines are being rapidly developed to the north in the territory of Rhodesia. The mines of the Rand, or the Johannesburg mines, as they are sometimes called, have drawn thousands of gold-seekers to this district, and by peopling the Transvaal with an alien element have been responsible to some degree for the recent dissensions in that republic. Gold was discovered there in 1883, and beginning with a small output in 1884 of about \$50,000, they have each year added an increased amount to the world's gold supply. In the ten years, from 1888 to 1898, the annual product of these mines rose from \$5,000,000 to \$55,000,000. A large amount of capital was necessary for the working of the mines, which were not adapted to hand or placer mining. Since 1884 the total value of the products of the Rand mines is estimated at over \$300,000,000. South and Southeast Africa also contain valuable deposits of iron, coal, and other minerals, but these have not yet been developed.

Railways.—There has recently been a very rapid development of railways in Africa, and in 1899 it was estimated that the total mileage of roads completed or under actual construction was 10,000. A large part of the route from Cape to Cairo is covered by rail, and since the line already completed from Cape Colony to the north is about 1400 miles, and from Cairo to the south about 1100 miles, there remains only the intermediate distance of 3000 miles to be spanned if the Cape to Cairo project proposed by Mr. Rhodes is carried out. Railway lines from the east and west to connect with this trans-African railway are already completed or in process of construction. On the eastern coast there is a line already completed in Natal; another running northwesterly from Mombasa in British East Africa toward Lake Victoria Nyanza is completed for half of the route; another in German East Africa, from a point just north of Zanzibar, is in process of construction, and another also in German East Africa is projected from Zanzibar to Lake Victoria Nyanza. Another line on the east coast runs inland from Lorenzo Marques, in Portuguese East Africa, and another from Beira, farther north. In the French

Soudan there is a short line running from the Senegal to the Niger. In the Congo Free State a line connects the Upper with the Lower Congo. In Angola a line runs easterly from Loando. There are other projected lateral lines on both the east and the west, and there is even a project for a great trans-continental line through the French Soudan, which would join the countries of the Niger and the Senegal with those of the Nile Valley and the Red Sea. The greater part of the roads actually constructed are owned by the states or colonies through which they pass. Of nearly 3000 miles in Cape Colony and Natal, about 2000 belong to the government, and almost all of the lines in Egypt are owned and operated by the state.

Commerce.—The greatest development of commerce is found in the north and the extreme south. The north receives nearly three-fourths of the imports, which are for the consumption of the thickly populated regions along the Mediterranean and in the Soudan. In the south the greater part of the imports go to the gold and diamond region. While the north imports chiefly articles of personal consumption, the southern imports are largely made up of machinery and materials used in the mines, although flour, meat, and clothing make up an important part. The most rapid development of commercial ports has been in the south, where the business of the mines has stimulated trade. The ports of Cape Colony and Natal have increased in recent years at a remarkable rate. The chief sharer in African trade is England, owing to the fact that in the south her colonies of Cape Colony and Natal receive the imports destined for the mining regions, and are themselves wealthy and progressive countries. At the same time England's control of Egypt has resulted in giving to England a great share of Egyptian trade. The total foreign commerce of Africa is estimated at \$750,000,000, but much of the trade is not recorded. According to the report of the United States Bureau of Statistics, published in 1899, the importation at the ports where records were kept amounted, according to the most recent available figures, to \$395,296,552, and the exports to \$345,773,454. The chief exports of the north were agricultural products, cotton, cacao, spices, dates, etc.; of the tropical region ivory, rubber, palm nuts, and gums, and of the south, gold and diamonds. The distribution of imports among the possessions of the different powers was given as follows:

British territory.....	\$131,397,798
French territory.....	70,115,508
Turkish territory.....	54,090,670
Portuguese territory.....	11,862,729
German territory.....	4,992,907
Congo Free State.....	4,521,449

Commerce with the United States.—Less than 5 per cent. of the imports into Africa come from the United States, their value in 1898 being \$17,515,730. But the exports from the United States have shown relatively a very rapid increase owing to the increased demand for United States products in South Africa. The total exports from the United States to Africa rose from \$6,377,842 in 1895, to \$18,504,424 in 1899. The following table taken from the report of the United States Bureau of Statistics in 1899 gives the total value of imports into the United States from Africa, and exports from the United States to Africa, from 1890 to 1899, inclusive, for the fiscal year ending June 30:

Imports.		Exports.	
1890.....	\$ 3,321,477	1890.....	\$ 4,613,702
1891.....	4,207,146	1891.....	4,757,807
1892.....	5,318,052	1892.....	5,061,265
1893.....	5,857,032	1893.....	5,196,480
1894.....	3,479,338	1894.....	4,923,859
1895.....	5,709,169	1895.....	6,377,842
1896.....	11,172,979	1896.....	13,670,580
1897.....	9,529,617	1897.....	16,952,807
1898.....	7,193,639	1898.....	17,513,411
1899.....	10,440,060	1899.....	17,999,379

The Situation of Africa in 1899.—During the year 1898 the main objects of public attention in African affairs were the reconquest of the lost provinces of the Soudan by the Anglo-Egyptian army under Lord Kitchener, the dispute between France and England over the boundaries of their respective territories on the Niger, the still more serious dispute over the Fashoda question, the internal dissensions in the Transvaal, and the great Cape to Cairo railway project of Cecil Rhodes. In the course of the year the Niger boundary dispute was settled, and the conquest of the Soudanese provinces was practically completed; but the other matters were still subjects of discussion at the beginning of 1899. The long-standing Fashoda ques-

tion, which passed its acute phase with the withdrawal of Major Marchand from Fashoda toward the close of 1898, was finally adjusted on March 21, 1899, by the Anglo-French convention, which gave to England the territory which she had claimed on the Upper Nile, but compensated France by some valuable concessions elsewhere. (See FRANCE, paragraphs on History.) The chief interest in North-east Africa was thenceforth centred in the re-establishment of the Soudanese provinces under Lord Kitchener. (See EGYPT.) As to the Cape to Cairo railway project (*q. v.*), the most striking event was the visit of Cecil Rhodes to the German Emperor for the purpose of enlisting his aid on its behalf. But by far the most serious events occurred in the Transvaal, and culminated in the war between England and that republic, which was going on at the close of the year. An account of this will be found in the historical portions of the article on the Transvaal.

AFTER-IMAGES. An after-image is the impression still remaining in the eyes after looking at a light or indeed any visual stimulus of medium intensity. It is not observed ordinarily, unless the attention is called to it, and some persons disclaim all ability to see this effect at all. The after-image and its curious cycle of changes which have been observed by psychologists is the subject of a work published in 1899 by Dr. S. I. Franz. He found that to see an after-image seventy-five per cent. of the times the eye is stimulated it is necessary to have as stimulation either .01 second exposure, a surface of light 8 millimetres square ($\frac{1}{4}$ inch), and a light of .08 candle-power; or one second of exposure would require a surface only two millimetres square and .08 candle-power light; or, if the surface 8 millimetres square were exposed one second, a light of only .01 candle-power would be necessary. A number of interesting and curious features concerning the after-image should here be stated. (1) If one looks at a bright light and then completely darkens the eyes, the after-image does not immediately appear. For a short time nothing is seen. This short time is called the "latent period" of the after-image, and varies not only in individuals, but more or less with the strength of light used, the length of time it is looked at, and the area of the light. (2) The time the after-image lasts also varies with the different degrees of the three factors of the sensation—namely, the time, area, and intensity, and also according to the color of the light and the part of the retina which is affected by the light. The average duration of the after-image seems to be from twenty to one hundred seconds, though from extraordinarily strong lights it has been observed by some persons for days at a time. The influence of the color is shown by the fact that a white light gives the longest, and a yellow light or a green light produces a longer after-image than red or violet lights. In addition to these varying influences, there is seen to be much difference in the qualities of the after-image among different people, some, as has been mentioned, failing to notice it, and others being able, particularly after their attention has been called to it, to give a very good account of it. This suggests, what is probably the truth, that the after-image is something between a sensation and an idea. It is therefore largely influenced by the attention and the will. This influence of the mind is shown in another of the curiosities of the after-image—namely, its fluctuation. (3) The after-image of a bright white light is first seen by some persons as white, then black, then red, green, violet, etc., going through most of the colors of the rainbow before it finally disappears. In a series of experiments performed at the Columbia University laboratory it was found that with seventy-five students the first color seen was blue in 13 per cent. of the cases, purple in 10 per cent., green in 6 per cent., yellow in 4 per cent., and red in 2 per cent. of the cases. It does not always melt gradually from one color into another, but appears as one color, then disappears, to reappear as another color, and so on. An interesting account of the fluctuations of the after-image by a trained observer is that of Miss Washburn (*Mind*, January, 1899). She looked simply at the bright sky through the upper half of a window. She describes her after-images as follows: "After the momentary, positive, same-colored image, which appeared immediately on closing the eyes, there was an interval of five or six seconds, when a positive image came again. This image was at first rather fluctuating in color—patches of red and green sometimes appearing on it, but in a second or two the panes of the window filled out with sky blue, the window bars remaining dark. This blue stage then passed into a stage of vivid green, the image sometimes, but not always, disappearing between the two stages. The green image usually disappeared and reappeared five or six times, growing paler, almost whitish, in color toward the end. The image next assumed a deep red tone, while the black bars became luminous and slightly greenish, the light appearing first as a crack through the length of each dark bar. Here, of course, was the transition from the positive to the negative image. The red stage, after undergoing several fluctuations, gave place to a deep blue image with yellowish bright lines, which lasted longer than any of the preceding, growing gradually darker, until it became indistinguishable." (4) The after-image retains the *shape* of the light by which it is originally produced,

and (5) follows the movements of the eye. (6) Its shape is, however, apparently altered, according to the angle of the plane of the surface looked at. For instance, if one looks first at a square, the after-image of this figure, when the eyes are directed perpendicularly toward a plane surface (such as a white wall), will appear in shape like the original figure; but if the eyes are directed at an acute angle with the wall, the figure will appear to be a rhombus. (7) Some persons have thought that they could transfer an after-image from one eye to the other. If the left eye be closed and the right directed to a bright light for a few seconds, they claim the after-image will be transferred from that eye to the right. This they hold to be a proof that the after-image is the result of the activity not of the retina, but of the brain, because if it were of the retina, it would be seen only in one eye. Both the facts and the theory of these persons have been disputed by others, who point out that the two eyes always operate as one machine, and it is impossible to say that an after-image is seen in one eye to the exclusion of the other; or that, if it were, this would not prove that a stimulation of one retina would cause activity of a like nature on the part of the other. (8) After-images are peculiar phenomena, psychologically, as they lie on the borderland between sensation and idea. They generally have to be produced, like sensation, by an objective stimulus, though cases are on record of their having been created by a mere effort of will. On the other hand, they are largely affected and can sometimes be controlled by subjective effort. Miss Washburn (*vid. supra*) succeeded in controlling to a certain extent the fluctuation of colors in her after-images by conscious voluntary effort. (9) The after-image is to be distinguished, by several criteria, from the memory image, so called. The memory image is not, like the after-image, only a visual image, but may be from any one of the senses. It is illustrated by the recurrent mental vision of some sight which has profoundly impressed the spectator emotionally, or has made a deep impression by long-continued use, as the field of a microscope returns before the mind's eye of those who use it much. Another illustration is the frequency with which a musical air recurs in the memory, independently of the will. Other features of the memory image, distinguishing it from the after-image, are the natural color and proportions of the former as contrasted with the peculiar color cycles of the after-image and its tendency to follow the eye and conform itself to the angles of the surfaces upon which it is projected. It is considered to be universally true of after-images that they seem larger when projected on a distant surface than when thrown on a near one. The visual images of imagination, on the other hand, are never thus affected. For an ingenious use of the after-image in the methods of experimental psychology, see **PSYCHOLOGY, EXPERIMENTAL** (paragraph Psychology of Reading).

AGASSIZ ASSOCIATION, an association of young people, founded in 1875, for the purpose of encouraging personal work in natural science. The society was incorporated in 1892. It publishes the *Hand-book of Agassiz Association*. The official organ is *The American Boy*. President, Harlan H. Ballard; secretary, E. T. Slocum, Pittsfield, Mass.

AGNEW, JOHN THOMPSON, who died November 29, 1899, was a well-known banker and representative Democrat of New York City. For the past thirty years he had been vice-president of the Continental National Bank. For the previous thirty years he had been a member of the wholesale tobacco house of William Agnew & Sons. In his political life he was a strict party man. He was associated with August Belmont, William Wood, and W. C. Hunt in laying the foundations of the political prosperity of Tammany Hall. He was a personal friend of Tilden and Governor Hoffman, and was himself offered the Democratic nomination for governor in a year when his party was successful. He was also a member of the Electoral College that chose Cleveland and Hendricks. Mr. Agnew was, further, president of the Park Bank in the seventies and trustee of the Brooklyn Bridge, 1877-85, and of the Presbyterian and Ear and Eye Hospitals. He was also a member of many societies and clubs, being one of the founders of the Manhattan Club.

AGRICULTURE. The solution of problems connected with the sciences underlying agriculture and the practical application of these results show a steady increase,

The sciences underlying agriculture are various, hence agricultural progress means increased activity along more than one line, and since the chief aim of agricultural progress is utilitarian in its nature, this spirit is being continually inculcated in its associated branches of science. While there has been a wholesome and persistent progress made in the sciences relating to agriculture during the past year, it is not easy to discern at the present time whether any of these discoveries will exert a revolutionary influence upon agricultural practices. Indeed, it is very seldom that we can properly estimate the importance of a single scientific discovery at its birth, but must wait some time in order to obtain a retrospective view of the same. The discovery of special bacteria capable of giving superior

flavor to butter, etc., was heralded a few years ago as an epoch-making discovery in dairying, but experiments made during the last two years have resulted in causing dairymen to look at the pure-culture practice in a much less favorable light. On the other hand, the discovery of bacteria in the tubercles of the leguminosæ a number of years ago was not thought to be of any great practical utility, but every year's experiments have shown that these organisms in possessing the ability to utilize the free nitrogen of the air and surrendering it to the plant are capable of being of the greatest practical value to agriculturists. It is not so much the results of single experiments leading to discoveries which constitute the greatest value to science, but, on the other hand, it is the correlation of the results of various experiments which enables us to recognize progress. The past year has witnessed progress in the agricultural institutions of the United States devoted to teaching, and the agricultural experiment stations have shown evidence of advancement in presenting a more thorough, higher, and more permanent class of work.

Experiment Stations.—Agricultural experiment stations are now in operation under the Act of Congress of March 2, 1887, in all of the States and Territories. The total number of experiment stations in the United States is 54; of these, 52 receive the appropriation provided for in the Act of Congress of 1887. The total income of the stations during 1898 (later statistics are not at hand) was \$1,210,921.17, of which \$720,000 was received from the national government, the remainder, \$490,921.17, coming from the following sources: State governments, \$341,897.94; individuals and communities, \$177.20; fees for analysis of fertilizers, \$93,677; sales of farm products, \$65,356.25, and from miscellaneous sources, \$20,312.48. In addition to this, the United States government appropriated \$35,000 for the years 1898 and 1899, \$5000 of which goes for Alaskan investigation, where an experiment station has already been established, and the remainder is used for special work connected with other stations. In each of the States of Alabama, Connecticut, New Jersey, and New York a separate station is maintained wholly or in part by State funds, and in Louisiana a station for sugar experiments is maintained partly by funds contributed by sugar planters. Efforts are also being made at the present time to establish stations in Hawaii, Porto Rico, and the Philippines. According to government statistics, the value of additions to equipment of stations during 1898 is as follows: Buildings, \$109,851.65; libraries, \$11,700.73; apparatus, \$19,195.42; farm implements, \$10,800.27; live stock, \$13,151.33; miscellaneous, \$11,972.97, which gives a total of \$176,469.41. At the present time the stations employ 669 persons in the work of administration and investigation.

The number of officers employed in the different lines of work is as follows: Directors, 75; chemists, 148; agriculturists, 71; experts in animal husbandry, 10; horticulturists, 77; farm foremen, 29; dairymen, 21; botanists, 50; entomologists, 46; veterinarians, 26; meteorologists, 20; biologists, 11; physicists, 11; geologists, 6; mycologists and bacteriologists, 19; irrigation engineers, 7; in charge of sub-stations, 15; secretaries and treasurers, 23; librarians, 10, and clerks, 46. There are also 21 persons classified under the head of "miscellaneous," including superintendents of gardens, grounds, and buildings, apiarists, herdsmen, etc. Three hundred and five station officers do more or less teaching in the colleges with which the stations are connected.

In 1898 there were published 406 annual reports and bulletins. In addition to this, there was published by many States a number of press bulletins or digests, which were widely reproduced in the agricultural and rural papers. The experiment station mailing list now aggregates half a million names, and correspondence with farmers is constantly increasing. It may be of interest to compare the condition of the experiment stations in the United States in 1889. There were at that time 46 stations, with a staff of 402 men, having a government appropriation of \$600,000, and \$125,000 was received from the States and other legal sources, which shows a considerable increase during the last ten years, both in funds and investigators.

It is impossible, on account of the limited space given to this subject, to present a résumé of the enormous number of papers published annually upon agricultural subjects. Some idea, however, can be obtained of this work by consulting the tenth volume of the *Experiment Station Record*. This volume, which attempts to give an abstract of most of the agricultural literature published throughout the world, comprises for 1899 1220 pages and contains abstracts of 361 bulletins and 35 annual reports of 53 experiment stations in the United States, 172 publications of the Department of Agriculture, and 1224 reports of foreign investigations. The total number of pages in these publications is 57,230; the total number of articles abstracted is 2023, which touch upon such subjects as chemistry, botany, fermentation, bacteriology, zoology, meteorology, air, water, soils, fertilizers, field crops, horticulture, forestry, seed, weeds, diseases of plants, entomology, food and animal production, dairy farming and dairying, veterinary science, technology, agricul-

tural engineering, and statistics. The aggregate number of articles abstracted for the preceding year (1898) was 1810, or over 200 less than in 1899.

Some important lines of experiment station work may be briefly referred to here. The life history of noxious insects and the methods of combating the same is receiving constant attention, and the importation of a Mediterranean insect into California for the purpose of fertilizing the fig is meeting with success. The annual appropriation of \$200,000 by the State of Massachusetts for the suppression of the gypsy moth constitutes the most important economic experiment so far attempted. The introduction of many new economic plants into the United States, the testing of new varieties of grasses and fruits, and the breeding and selecting of plants for the purpose of obtaining hardy stock for certain localities have received much attention. The plant diseases that have been studied are the peach-leaf curl and pear blight, also some characteristic of the sweet potato, sea-island cotton, lemon, orange, asparagus, chrysanthemum, tobacco, etc. Co-operative work in forestry has been begun with farmers, and the study of soils and irrigation in the West has received much attention. The investigations relating to animal feed-stuffs, fertilizers, plant foods, soil exhaustion, and dairy work have accomplished much.

In Japan the organization and work of experiment stations has recently been much improved. Less than a decade ago Japan could boast of only one station, whereas at present there are in that empire ten experiment stations under government control, besides nineteen branch stations, the chief work of which is to teach farmers the application of the results obtained by the more technical experiment stations.

The British government has recently established an elaborate plan for agricultural education and research in the West Indies. Four central and eight local experiment stations for the improvement of sugar-cane are to be established on the island of Barbados, and similar investigations are being inaugurated at Antigua, St. Kitts, and Trinidad. Botanical stations are to be continued and developed at Tobago, Grenada, St. Vincent, Barbados, St. Lucia, Dominica, Montserrat, Antigua, and St. Kitts Nevis. An agricultural school has been opened at Dominica, and others will be started at St. Lucia, St. Vincent, and St. Kitts Nevis.

Agricultural Teaching.—Agriculture, although resting on the foundation of a number of biological and abiological sciences, is not itself differentiated enough at the present time to be classed as a science. In this respect it resembles geography, which has for its aim the teaching of a great variety of natural phenomena. As a result of this heterogeneity, agriculture has never possessed a logical or pedagogical form, and further attempts have been made during the past year to improve its subject-matter and its sequence of presentation in courses of study. Any effort to straighten out the collegiate course in agriculture must be considered decidedly in the line of progress, inasmuch as agriculture is not likely to be confined in the future to special institutions, but on account of its necessitating a broadly related knowledge of a number of fundamental sciences, it possesses great pedagogical advantages, which are already being made use of in our secondary schools. It is, indeed, in this line of elementary teaching of agriculture that the present year shows remarkable progress and opens up prospects for agriculture which have never before been realized.

During the past year a law has been passed in Missouri calling for instruction in agriculture and horticulture in the public schools, and the State of New York appropriates \$25,000 per annum for the purpose of carrying on simple experiments in crop fertilization in different sections of the State as object-lessons to farmers, the instruction of the school teachers in rural districts in nature study work, and the introduction of nature study into the rural schools. This work is carried on by means of leaflets written in a pleasing and elementary manner, describing simple experiments in plant growth, etc., by personal contact with teachers and by extensive correspondence. By this means it is intended not only to teach the rising generation of farmers how to observe, think, and draw deductions from phenomena, but it is also endeavoring to accomplish great results in educating the farmer to appreciate modern methods of agricultural practices. The result hoped for in all this work is to cultivate a love for nature, to render farming less prosaic, and develop a spirit of content in the rural community. The State of Indiana through its agricultural institution at Lafayette has made a beginning in a similar line of work, but at the present time no large appropriation has been granted for this enterprise.

In addition to this work just described, there are numerous farmers' reading courses established in many of our States, which have for their aim the diffusion of agricultural knowledge and development of enthusiasm in the farmer. Much progress has been made in this movement within the past year. The courses of reading are conducted by the agricultural institutes and experiment stations of the several States in which they have been established. At the present time such reading courses are given in Pennsylvania, Michigan, New Hampshire, Connecticut,

New York, West Virginia, and South Dakota. A large series of popular works upon agriculture are pursued by the members of these reading clubs, and the amount of interest manifested in them is increasing. Supplementary to work of this nature are the farmers' institutes which are in general operation throughout the United States. They are generally supported by the State, and are under the control of the State Secretary of Agriculture or some other person authorized to manage them. Statistics in regard to farmers' institutes show that during the past year some two thousand institutes were held in different parts of the country, which were attended by about one-half million of farmers. The character of these meetings is constantly changing for the better, which is due in a large measure to the influence of the agricultural colleges and experiment stations. During the past year the services of college and station officers have been in greater demand at the farmers' institutes than ever before. Increased interest in agricultural teaching has also been manifested in many foreign countries within the past year. Beginning with the September school term of 1899, the minister of education in Ontario has made agriculture a compulsory subject in two forms of all the rural public schools, and allows it to be taken as an optional in all urban public and high schools. Manitoba has taught agriculture in her public schools for two years, and this subject is still being pursued, and during the past year Nova Scotia and New Brunswick have added agriculture to the curricula of their common schools.

In European countries the interest in agricultural teaching is receiving unusual attention. Steps have already been taken in Russia for the establishment of about 50 additional agricultural schools. There are at the present time in Russia 3 schools for higher agricultural instruction, 9 agricultural high schools, 83 lower schools, and 59 special courses, and the new elaborated plan calls for an extensive system of agricultural education. The scheme provides for (1) higher education, furnished by independent agricultural institutes, located in the chief agricultural zones of Russia, and by chairs of agricultural and allied sciences in the universities; (2) agricultural high schools, which are in the nature of technical schools and schools with courses in agriculture; (3) lower agricultural schools, and (4) the diffusion of general agricultural information.

In the British West Indies arrangements have been made to instruct the teachers of elementary schools in agriculture, and it is also proposed to attach an agricultural instructor to the various stations established throughout the British West Indies, whose purpose it will be to go about giving instruction and demonstrations to planters, etc.

In Germany, where there are already many schools of different grades devoted to agricultural and horticultural pursuits, we find progress still being made in introducing agricultural teaching in the secondary schools. Some of the common schools possess extensive and well-defined nature study courses, in which agricultural and horticultural subjects predominate, and these schools are in some cases provided with extensive gardens and vineyards, that are cared for by the students, and which enable them to become familiar with many vital points connected with gardening. These types of schools are on the increase in Germany at the present time.

The authorities of France are thoroughly awake to the necessity of agricultural training, and are at present inaugurating and carrying on a thorough system of agricultural training. In conclusion, we believe it is but just to state that the work inaugurated and accomplished during the past year, as shown by the scientific quality, practical value, and amount of research work turned out, the great impetus given to agricultural teaching throughout the civilized world, which is the best indicator of the universal recognition which agriculture is receiving, cannot be equalled by any other branch of industry or science.

Text-books, etc.—The following works of a general nature have appeared during the year: *The Principles of Agriculture*, by L. H. Bailey et al.; *Outlines of Dairy Bacteriology*, by H. L. Russell; *Primer of Forestry*, by G. Pinchot; *Text-book of Agricultural Botany*, by J. Percival. See COTTON AND THE COTTON INDUSTRY; SILK MANUFACTURING; IRRIGATION.

AGUINALDO, EMILIO, the leader of the Filipino insurrection against the United States, was born about thirty years ago. After the native insurrection of 1896 he went to Hong Kong, agreeing permanently to forsake the Philippines on the payment of a large sum of money by Spain. In 1898 he returned to Manila with the expressed purpose of aiding the United States. Although he is said to have been an efficient ally for a time, his methods were somewhat dictatorial. He represented the American Consul at Hong Kong as promising him, on the authority of the United States, the future independence of the Philippines, and when he became convinced that annexation was the only hope, he organized a provisional government and proclaimed himself president, in June, 1898. Severe but ineffective fighting was carried on against the United States troops by Aguinaldo's forces

during 1899. He showed considerable ability in organizing and holding together the various elements which made up his recruits, as well as in checking the jealousy and rivalry which were in evidence among some of his officers. Finally Luna, the insurgent Secretary of War, and with Pilar, the most dangerous rival of Aguinaldo for the dictatorship, was assassinated. On the anniversary of the declaration of the independence of the Philippines, in June, 1899, Aguinaldo delivered a fervid speech, which was printed in the national organ, *Independencia*. In this apostrophe to his countrymen, the Filipino chief declared that Spain should be forgiven and be recognized as the mother-country, but that the United States should be driven out and the independence of the islands achieved. On July 27 he addressed an appeal to the powers for the recognition of independence in the Philippines. Soon after this the native troops became so hard pressed by the Americans that their leader was forced to move his capital from place to place. After retreating with a small detachment for several weeks before the American advance, he fled to the mountains. There he was closely pursued for a time, but without being taken. In regard to the personality of Aguinaldo, few authoritative statements are obtainable. It seems to be generally conceded among those who have known Aguinaldo personally that he is shrewd and naturally intelligent; brave; often kind, especially among his troops, but sometimes vindictive. It is said that he is possessed of a certain magnetism, and has considerable tact, to which is attributed much of his influence among the natives. There is a considerable difference of opinion as to the extent of Aguinaldo's education, but he is far better taught than the average Filipino. It has been said on the one hand that, although naturally sincere, he is easily influenced by unscrupulous advisers, while on the other hand an educated Filipino of this country says that he brooks no opposition, and that in no event does he consult with others. In the United States distrust is felt by many people as to the motives of Aguinaldo. Others consider him in the main right-minded, but unable to compel the forces over which he exercises a nominal authority. A third group has placed him upon a pedestal as a second Washington.

AIR CUSHIONS. See ELEVATORS.

ALABAMA, one of the Gulf States of the United States, has an area of 52,250 square miles. The capital is Montgomery. Alabama was admitted to the Union December 14, 1819.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 33,015,120 bushels, \$15,517,106; wheat, 431,186, \$383,756; oats, 3,012,070, \$1,295,190; rye, 14,576, \$15,159; potatoes, 335,832, \$202,174, and hay, 82,746 tons, \$943,304. Live stock, January 1, 1900, comprised: Horses, 133,546, \$6,105,518; mules, 132,321, \$7,961,050; milch cows, 231,602, \$4,265,157; other cattle, 279,278, \$3,061,719, and sheep, 171,799, \$262,767. See COTTON AND THE COTTON INDUSTRY.

Industries.—The annual report of the State Mine Inspector, issued in 1899, shows that the total output of coal in 1898 was 6,504,960 tons, an increase over the previous year, which reached the highest figure up to that time, of 611,189 tons. Jefferson County, which contains Birmingham, led with 4,048,554 tons, and the smallest output was in Winston County, 7839 tons. The average number of working days was 300, and 1899 opened with a promise of work six days a week throughout the year. There were no labor troubles nor prospects of any. The most notable industrial feature of 1899 was the unusual activity in iron and steel interests. A syndicate of Northern capitalists bought a group of coal, iron, furnace, and coking properties, and within the year built nearly 500 additional coke ovens, trebled the output of coal, and secured an aggregate capacity of 180,000 tons of pig-iron per annum. Another syndicate bought the Talladega Iron Furnaces, with 3000 acres of coal and iron lands, for immediate and fuller development. Twelve additional furnaces in various parts of the State were put in blast, increasing the iron output of the State by more than 20 per cent.

At Ensley, near Birmingham, Thanksgiving Day was celebrated by making the first run of steel in the new mill of the Alabama Steel and Shipbuilding Company. This plant has a capacity of 1000 tons per day, has 12 furnaces, and cost \$1,500,000. Near by is the new steel rod, wire, and nail mill of the Alabama Steel and Wire Company, which cost about the same amount, and was expected to be ready for work early in January, 1900. In the same line is to be noted the sale to an iron and steel company of 3440 acres of coal lands belonging to the State University for immediate development. The year was also a remarkably prosperous one for the cotton mills. There was a further large increase in the number of looms and spindles, and the Dallas mill doubled its capital preparatory to erecting a new plant with 1000 looms, 25,000 spindles, and a bleachery, for the manufacture of a finer grade of goods than has yet been attempted in the South.

The coking industry was represented in 1898 by 24 establishments, with

5363 ovens, which used 2,573,713 short tons of coal and yielded 1,479,437 short tons of coke, valued at \$3,064,960, giving the State third rank in this industry. Alabama also held third place in the production of iron ore, the output being 1,853,111 long tons of red hematite and 548,637 long tons of brown hematite, in all 2,401,748 long tons, valued at \$1,632,208, an increase in a year of 303,127 long tons. The production of pig-iron was 1,033,676 tons, and of all kinds of rolled iron and steel, 59,897 long tons. The quarry products were sandstone and limestone, of a total value of \$270,177. See ALUMINIUM; COTTON AND THE COTTON INDUSTRY.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the port of Mobile were valued at \$1,590,648, an increase in a year of \$466,247, and the exports were valued at \$8,902,119, a decrease of \$682,129. The imports of gold and silver amounted to \$37,059, a decrease, and there were no exports of either during the year. The total foreign trade of the port was \$10,629,826, a decrease of \$134,675 from that of the previous year.

Railways.—With the exception of Louisiana there was a greater mileage of new construction completed in Alabama during the calendar year 1898 than in any other Southern State, and among all the States Alabama ranked sixth in this respect. The actual construction was 150.30 miles. In 1899 it was 141.35 miles, giving the State an aggregate of 4047.59 miles.

Banks.—On October 31, 1899, there were 27 national banks in operation and 13 in liquidation. The active capital aggregated \$3,205,000; circulation, \$1,309,220; deposits, \$9,577,401; reserve, \$2,750,445; and resources, \$15,945,793. The State banks, June 30, 1899, numbered 19, and had capital, \$938,200; deposits, \$2,212,777; and resources, \$3,794,112. The exchanges at the United States Clearing-House at Birmingham in the year ending September 30, 1899, aggregated \$30,215,716, an increase in a year of \$7,109,273.

Education.—In the common school statistics there are no changes to report from those of the school year 1896-97. At the close of the school year 1897-98 there were 48 public high schools reported, with 117 teachers and 2577 students; 66 private secondary schools, with 164 teachers and 2761 secondary students and 3836 elementary pupils; 6 public normal schools, with 91 teachers and 1570 students; and 3 private ones, with 97 teachers and 1506 students. Nine colleges and universities for men and for both sexes reported 38 scholarships; 114 professors and instructors; 1823 students; 61,250 volumes in the libraries; \$70,350 invested in scientific apparatus; \$865,000 in grounds and buildings, and \$365,000 in productive funds; and \$115,115 in total income. A like number of colleges for women reported 101 professors and instructors; 1057 students; 9700 volumes in the libraries; \$321,000 invested in grounds and buildings; and \$83,500 in total income. In 1889 there were 232 periodicals, of which 21 were dailies, 187 weeklies, and 11 monthlies.

Finances.—The total bonded debt of the State on March 1, 1899, was \$9,357,600, no change being reported in the preceding year. The assessed property valuations in 1898 aggregated \$256,256,295, an increase of \$4,866,161; tax rate, 5½ mills; and amount of taxes, \$1,410,191.

Population.—As estimated by Federal officials, the population on June 30, 1899, was about 1,730,000.

Legislation.—Laws in the interests of primary elections were enacted, in accordance with which frauds, if detected, may be punished. The song-birds were protected by game laws of a stringent character. A full system of quarantine was established to ward off infectious diseases. The claims of labor were recognized by making labor wages preferred claims when receivers of corporations are appointed. A dispensary law for the sale of liquors was passed. To the list of misdemeanors were added: Making or certifying false abstracts; detaching or uncoupling trains, pulling bell-cords or emergency valves; obstructing tracks; interfering with switches or signals without authority; stealing a ride or discharging firearms from trains. A license tax on nearly all occupations was provided for, but cotton and other agricultural products and pig-iron are exempt from taxation in the hands of producers or purchasers for prompt shipment.

State Officers and National Representatives.—Governor, Joseph F. Johnston; secretary of state, Robert P. McDavid; treasurer, George W. Ellis; auditor and comptroller, Walter S. White; adjutant-general, W. W. Brandon; attorney-general, Charles G. Brown; superintendent of education, John W. Abercrombie; commissioner of agriculture, Isaac F. Culver. Supreme Court: Chief justice, Thomas N. McClellan; associate justices, Jonathan Haralson, John R. Tyson, Henry A. Sharpe, and James R. Dowdell; clerk, R. F. Ligon, Jr. The State Legislature consists of 1 Republican, 101 Democrats, and 21 Populists. Senators: John T. Morgan and Edmund W. Pettus, both from Selma. Representatives: George W. Taylor, from Demopolis; Jesse F. Stallings, from Greenville; Henry D. Clayton, from Eufaula; Gaston H. Robbins, from Selma; Willis Brewer, from Hayneville;

John H. Bankhead, from Fayette; John L. Burnett, from Gadsden; Joseph Wheeler, from Wheeler; and Oscar W. Underwood, from Birmingham—all Democrats.

ALASKA, an unorganized territory of the United States, comprising the north-western part of North America, purchased from Russia in 1867, with an area, as far as now known, of 531,000 square miles; seat of administration, Sitka.

Topography.—During 1899 several parties were engaged in the examination and survey of Alaskan waters, under the direction of the United States Coast and Geodetic Survey. The coast-line of the central part of the Yukon delta was found to be 10 miles farther to the westward than previously charted, and the river from its mouth to Andreafski 25 miles longer than heretofore supposed. One party mapped the shore-line of the entire delta, a distance of 90 miles. The Coast Survey steamer *Patterson* ran 3600 miles of soundings to determine the character of the "mud lumps" of the Yukon flats; demonstrated that Golovin Bay is navigable for vessels drawing 16 feet of water as far as the inside spit, and that the lower bay and sound, instead of being filled with shoals, according to existing charts, is safely navigable for seagoing vessels; and discovered and surveyed a bay named Port Safety, 2 miles wide and 3 miles long, about 12 miles north of Cape Nome Bay.

The most important topographical discovery of the year was that of Captain William R. Abercrombie, U. S. A., who for two years had been at the head of an expedition organized to survey an all-American route from tidewater to the gold-fields. His work was completed in November, and the new route to the Klondike is briefly described as follows:

"The route selected is an almost direct path, 385 miles long, to Fort Egbert, Eagle City, on the Yukon River, and it is 60 miles from Eagle City by the river to Dawson, though the distance between the two places is not so far as that overland through Canadian territory. This route will open up the heart of Alaska and allow Americans to travel over their own domain without coming into conflict with the officials of a foreign nation. It is shorter by 200 miles than the present route by way of Dyea, Chilkoot Pass, Lake Bennett, and the Yukon River. Of course, the other route by way of St. Michael is out of the question. It is 2100 miles long."

Pending the settlement of the boundary question by the governments of the United States and Great Britain, and acting under the terms of a *modus vivendi*, negotiated on October 20, the following commissioners were appointed in December to delimit the provisional boundary between Alaska and Canada about the head of Lynn Canal: On the part of the United States, O. H. Tittman, assistant superintendent of the Coast and Geodetic Survey; on the part of Great Britain, Professor F. King, royal astronomer at Ottawa.

Industries.—The season of 1898-99 yielded much larger mining results than the previous one, due in a large measure to the remarkable yield of the newly discovered deposits in the Cape Nome region, between Norton Sound and Bering Sea, and about 70 miles from St. Michael. The first discovery here was made late in 1898, and, as it became known almost immediately, a rush set in for the region even greater than that which followed the early Klondike strikes. Experienced miners abandoned well-paying claims for the new bonanza, and by midsummer sufficient knowledge of the district had been acquired to warrant the assertion that it out-rivalled the Klondike itself, and to suggest the belief that the district contains the mother lode of a series that extends far into Siberia. In the midst of excitement over the Cape Nome developments, another surprise appeared as a result of prospecting at Cape York, 120 miles from Cape Nome, where, as at Cape Nome, rich beach diggings were disclosed. Both districts gave about equal promise, with an advantage for Cape York in the possession of an admirable harbor. Developments of more than usual interest were also made on Money Creek, Mary Island, and on the reservation of the American Missionary Association at Cape Prince of Wales.

It is impossible to give more than an estimate of the value of gold mined in the season of 1898-99. A few figures of known amounts are suggestive. On a single day, July 18, four steamers landed at Seattle, Wash.; San Francisco, and Vancouver, B. C., an aggregate valued at \$7,000,000. It was believed that at least \$2,000,000 more was brought down by passengers in small hand-packages, and not reported. George E. Roberts, Director of the United States Mint, stated in July that the American receipts from the Klondike in the first half of the calendar year amounted to \$11,000,000 in gold, and he estimated that the yield of the full year would be \$18,000,000 or \$20,000,000. The receipts of the first six months equalled the total of the previous year. United States Consul McCook, at Dawson, Yukon Territory, reported that instead of \$20,000,000, which was estimated as the probable output of that district, he was informed that \$10,000,000 would fully cover the product. He also declared his belief that more gold will be found in Alaska than will ever be taken from Yukon Territory.

Industrial operations in 1899 were by no means confined to gold. A railway is being constructed from tidewater to Cook Inlet to facilitate the mining of the large deposits of coal there in 1900. Three large copper-gold claims on Cape Fox were being prepared for thorough working by a Chicago syndicate. The copper mines on Prince of Wales Island yielded sufficient ore to promise the employment of large reduction works for several years to come. Encouraging results were also obtained from the White Horse copper district. The first discovery of asphaltum in Alaska was made on the shores of Mary Island, an extensive deposit of excellent quality. Late in the year machinery was assembled along the Cook Inlet coast for next season's development of the petroleum fields.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise in the customs district of Alaska were valued at \$196,251, and the exports were valued at \$45,729, an increase in each. The imports of gold aggregated in value \$9,065,000, against \$50 in the previous year, and there were no exports.

Banks.—On October 31, 1899, the Territory had one national bank, with capital, \$50,000; circulation, \$11,250; deposits, \$157,304; reserve, \$74,745, and resources, \$215,209.

Education.—In October, 1899, ground was broken in Skaguay for the first college in Alaska, a co-educational institution. It was opened for the fall term in a temporary building, with 50 students, and Dr. La Motte Gordon as president and Mrs. Sarah McComb as preceptress. The school population of the Territory in the year 1897-98 was from 8000 to 10,000, of whom 1250 were enrolled in 18 schools maintained by the government. The appropriation for the school year was \$30,000. Within two years towns have sprung up at St. Michael, Circle, Rampart, Peary, Weare, and Eagle, and government schools are now urgently needed in each of these places. In 1898 there was not a single school for white children in the vast region drained by the Yukon and its tributaries. A much larger appropriation is imperative. Besides the 18 government schools, there were an industrial school at Sitka, 13 Protestant Episcopal mission schools, 1 Congregational, 4 Roman Catholic, 7 Moravian, 1 Methodist Episcopal, 3 Friends, 1 Baptist, 7 Presbyterian, and 5 Swedish Evangelical. The Roman Catholic Church also maintains two hospitals at Dawson, Yukon Territory, and the Baptist Church an orphanage on Wood Island. At the end of 1899 there were 7 periodicals, of which 6 were weeklies.

Needs of the Territory.—A territorial convention was held in Juneau in October, 1899, which adopted a memorial to Congress setting forth some of the pressing necessities of the Territory. These include two additional judges of the district court; probate judges, with jurisdiction also in certain civil and criminal cases; commissioners with powers of justices of the peace, and magistrates with like powers, for incorporated cities and towns; larger educational facilities for white children; a code of civil procedure; amendments to the criminal code; a general municipal incorporation law; a modification of the mineral land laws, to prevent wholesale appropriations of public mineral lands by a few individuals; an extension to Alaska of the homestead, timber, stone, and coal-land laws, and a delegate in Congress. John G. Price, of Skaguay, was elected a representative of the people at Washington. Governor Brady, in his annual report, made another plea for Statehood, and urged the establishment of cable and telegraph lines, the branding of fur seals, a prohibition of killing them for ten years, and suitable public buildings at Sitka.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 40,000.

ALASKAN BOUNDARY QUESTION. *Diplomatic History of the Dispute.*

The Anglo-American dispute over the Alaskan boundary centres in the interpretation of certain passages in the treaty of 1825 between Russia and Great Britain. This treaty arose from the extension of Russian claims to lands over which Great Britain and the United States believed themselves to be entitled to jurisdiction. These Russian claims appeared in certain grants of privileges to the Russian-American Company. The ukase issued by Emperor Paul, in 1799, granted this company the right to use all hunting-grounds and establishments then existing on the Alaskan coast from 55° north latitude to Bering Strait, to make new discoveries south of that degree, and to occupy new lands as Russian possessions, if not already occupied by or dependent upon another nation. In 1821 the privileges granted to the Russian-American Company were enlarged, and the right of carrying on commerce, fishing, and other industries was extended to the entire northwestern coast of America, from Bering Strait to 51° north latitude. All foreign vessels were forbidden to land on the coasts or islands of this region, except in case of distress. This extension of claims aroused opposition both in the United States and in Great Britain, since each of these powers claimed lands north of the 51st parallel of latitude. Negotiations followed and resulted in a convention between the United States and Russia in 1824, and in the



THE NORTHERN TERMINUS OF THE WHITE PASS & YUKON RAILROAD, AT LAKE BENNETT, WHERE GOLD SEEKERS
CAN TAKE A STEAMER FOR THE KLONDIKE.

famous treaty between Great Britain and Russia of 1825. By the convention of 1824 it was provided that the United States should form no establishment north of the parallel of 54° and 40', and that Russia should form none south of that parallel. The treaty with Great Britain defined the boundary line between the Russian and the British possessions in articles 3 and 4, which will be discussed in the following paragraph. At this point we merely mention the fact that the terms of those articles did not become the subject of dispute until recent years. Not till 1872 was there any dispute as to the meaning of the definition contained in the treaty of 1825, the United States having in 1867 acquired Alaska from Russia, and having retained the boundary-line as described in the older treaty. On December 2, 1872, President Grant, in his annual message, drew attention to the fact that for the first time in the history of the United States there was no question of disputed boundary between this country and the possessions of Great Britain. But he recognized that difficulties might arise over the Alaskan boundary so soon as the territory should be settled and conflicting interests become apparent. He therefore recommended the appointment of an international commission to determine the line between our territory of Alaska and the adjoining possessions of Great Britain. His recommendation was not acted upon. A joint commission was again proposed in 1886 by the United States government, and in 1888 conferences were held between representatives of the United States and the Canadian governments to discuss the matter. In 1892 the governments of the United States and Great Britain entered into a convention to make a joint survey in order to ascertain the data necessary to the permanent delimitation of the boundary line. As a result of this the joint surveys were made, but no recommendation was offered as to the boundary line. Finally, by the protocol of May, 1898, one of the subjects to be discussed by the Joint High Commission was the provision for the delimitation of an Alaskan-Canadian boundary. The commission came to no agreement on this point, and in 1899 the question was still the subject of dispute; but on December 20 of that year it was announced that a *modus vivendi*, providing for a temporary and convenient boundary line had been agreed upon by the two governments. Thus the matter was taken out of the hands of the Joint High Commission. On the whole, this temporary settlement was to the advantage of the United States. The boundary being placed at a distance of 22¼ miles above Pyramid Harbor, the Canadians did not secure a point on the Lynn Canal; nor was any concession made of a free port or free transfer of Canadian goods through the American territory, although it was thought that these matters might come up for discussion later. The text of the *modus vivendi* is as follows:

"It is hereby agreed between the governments of the United States and of Great Britain that the boundary line between Canada and the territory of Alaska in the region about the head of Lynn Canal shall be provisionally fixed, without prejudice to the claims of either party in the permanent adjustment of the international boundary, as follows:

"In the region of the Dalton Trail, a line beginning at the peak west of Porcupine Creek, marked on the map No. 10 of the United States Commission, December 31, 1895, and on sheet No. 18 of the British Commission, December 31, 1895, with the number 6500; thence running to the Klehini (or Klahela) River in the direction of the peak north of that river marked 5020 on the aforesaid United States map and 5025 on the aforesaid British map; thence following the high or right bank of the said Klehini River to the junction thereof with the Chilkat River, a mile and a half, more or less, north of Klukwan; provided that persons proceeding to or from Porcupine Creek shall be freely permitted to follow the trail between the said creek and the said junction of the rivers into and across the territory on the Canadian side of the temporary line wherever the trail crosses to such side, and, subject to such reasonable regulations for the protection of the revenue as the Canadian government may prescribe, to carry with them over such part or parts of the trail between the said points as may lie on the Canadian side of the temporary line such goods and articles as they desire without being required to pay any customs duties on such goods and articles, and from said junction to the summit of the peak east of the Chilkat River, marked on the aforesaid map No. 10 of the United States Commission with the number 5410, and on the map No. 17 of the aforesaid British Commission with the number 5490.

"On the Dyea and Skaguay trails, the summits of the Chilkoot and White passes.

"It is understood, as formerly set forth in communications of the Department of State of the United States, that the citizens who are subjects to either power found by this arrangement within the temporary jurisdiction of the other shall suffer no diminution of the rights and privileges which they now enjoy.

"The government of the United States will at once appoint an officer or officers, in conjunction with the officer or officers to be named by the government or Her

Britannic Majesty, to mark the temporary line agreed upon by the erection of posts, stakes, or other appropriate temporary marks."

The following proposition from Canada for a permanent settlement of the boundary question was delivered to Ambassador Choate in London, October 24:

"That the boundary line be arbitrated upon terms similar to those imposed by the United States and Great Britain over Venezuela, particularly those provisions making fifty years' occupancy by either side conclusive evidence of title; occupancy of less than that period to be taken as equity allows under international law.

"That as a condition precedent to and absolutely preliminary to arbitration, Skaguay and Dyea would be conceded to the United States without further claim if Canada received Pyramid Harbor."

By this arrangement Canada would give up much of the disputed gold country in exchange for a seaport, but insists upon getting the latter before agreeing to arbitration of the boundary issue. At the close of the year the *modus vivendi* was still in force, the duties of the commissioners were uncompleted, but no further sessions had been held.

Nature of the Dispute.—The articles of the treaty of 1825, whose interpretation has been the chief cause of dispute, are 3 and 4. They read as follows:

"Article III.—The line of demarcation between the possessions of the high contracting parties, upon the coast of the continent and the islands of America to the northwest, shall be drawn in the manner following: Commencing from the southmost point of the island called the Prince of Wales Island, which point lies in the parallel of $54^{\circ} 40'$, north latitude, and between the 131st and 133d degree of west longitude (meridian of Greenwich), the said line shall ascend to the north, along the channel called the Portland Channel, as far as the point of the continent where it strikes the 56th degree of north latitude; from this last mentioned point the line of demarcation shall follow the summit of the mountains situated parallel to the coast, as far as the point of intersection of the 141st degree of west longitude (of the same meridian), and finally from the said point of intersection, the said meridian line of the 141st degree, in its prolongation as far as the Frozen Ocean, shall form the limit between the Russian and British possessions of the continent of America to the northwest.

"Article IV.—With reference to the line of demarcation laid down in the preceding article, it is understood—First. That the island called the Prince of Wales Island shall belong wholly to Russia. Second. That wherever the summit of the mountains, which extend in a direction parallel to the coast, from the 56th degree of north latitude to the point of intersection of the 141st degree, shall prove to be at the distance of more than ten marine leagues from the ocean, the limit between the British possessions and the line of coast which is to belong to Russia as above mentioned, shall be formed by a line parallel to the windings of the coast, which shall never exceed the difference of ten marine leagues therefrom."

The dispute has turned principally upon the interpretation of the words "a line parallel to the windings of the coast." The claim of the United States rests upon a literal acceptance of these words, assuming that the coast-line follows the windings of the coast even to the head waters of the longest inlets, while England and Canada have refused to admit that these inlets are ocean waters and have claimed that the coast-line should follow an imaginary line drawn across their mouths. In the case of the Lynn Canal, which is important as the natural entrance to the gold-bearing district of the Yukon, the United States claimed that the boundary line follows the summit of the mountain range which lies nearest to the head of the canal, thus including in United States territory the towns of Dyea and Skaguay, which lie about twenty miles inland, while the British claim would trace the boundary at a distance of thirty miles from the mouth of the canal, leaving these towns in Canadian territory. There were other points of the treaty in dispute, but this was the most important. The strength of the United States claim rested on the fact that the United States government remained in possession and for many years encountered no serious objection on the part of its rivals. Apparently the matter was not controverted at all until the 70's, when the discovery of gold in the southern part of British Columbia stimulated immigration to that region, whose natural outlet was within the territory claimed by the United States. In 1872 the legislative assembly of British Columbia passed a resolution requesting the government of the Dominion to take steps for the definition of the boundary. But nothing was done in the matter, and the United States continued in control. No formal protest appears to have been made by the Dominion government, although attempts were made to survey the region, and the 141st meridian, which marked the easternmost boundary of Alaska, was laid down. America's possession seems in fact to have been recognized, for the application of one Captain Moore, a British subject, to pre-empt 160 acres of land on the site of what is now Skaguay, was refused by the government Land Office in Victoria, on the ground that the land was not under the Dominion

laws and that the application must be made to the government at Washington. The Americans took their stand upon the principle of a long possession which was practically undisputed, saying that the matter had not been seriously questioned until after the rush to the Klondike in 1896. They maintained in effect that since no strenuous denial of America's claims had been made by the Canadian authorities in all these years, the latter were debarred from pressing the matter at the present time. American citizens had settled there and the country had been administered under American laws. Applications for the right of pre-empting land were made to the American government, and no serious doubt had apparently arisen until the discovery of gold in the Yukon. The Canadians on the other hand took their stand on the treaty of 1825, according to which they said that the head waters of the Lynn Canal belong to them. The fact of possession did not in their opinion affect the justice of their claim, which was at least a fit subject for arbitration. In the view of Americans it was no fit subject for arbitration, since such a course would risk the loss of territory which had been occupied by and tacitly recognized as belonging to Americans. The Canadians made some concession to this feeling by admitting that the arbitration should be based on the same principle as that in the case of Venezuela—that is, that the rule should be observed that title should be made good by an adverse holding or prescription of fifty years—political administration being regarded as sufficient to constitute such a holding even when the land was not actually settled. This was the status of the question when it came up before the Anglo-American Commission, which it was hoped, would come to a satisfactory agreement upon it, but this commission adjourned without having accomplished anything on this point. Americans were censured because they were unwilling to apply to themselves the principle which they had insisted upon in the case of Great Britain's controversy with Venezuela, but it has been pointed out that the cases are not comparable, since the Alaskan lands in dispute lie so much nearer to American territory and since the feeling in the United States ran so strongly against the abandonment of lands which had been settled by American citizens and whose administration had so long been in the hands of the American authorities. Whatever may be the value of these considerations from the point of view of logic, they are practically of the highest importance, for the public opinion in the United States was far more decided on this matter than it was in England in respect to the Venezuelan question. The award of the Venezuelan arbitration was a matter of comparatively little concern to the great mass of Englishmen, and they would probably have acquiesced in a verdict however adverse. In the Alaskan affair, on the other hand, a decision against the interests of the United States would have provoked the most serious opposition in that country and might have prevented the Senate from accepting the award. In England the interest in the Alaskan matter has not been very marked, but in Canada there have been many signs of strong resentment toward the policy of the United States in refusing to leave the matter to arbitration. The United States has in fact set its face decidedly against the surrender of any of its tide-water settlements in the disputed territory, yet it has not shown itself altogether unwilling to compromise. One compromise that has been proposed is the placing of Skagway under the joint administration of Canada and the United States and the internationalization of the White Pass and the Yukon Railroad. The Americans were also willing to permit the transit of munitions of war along this railroad in order to meet the complaint of the Canadians that under present conditions they were prevented from quelling by force of arms any disturbance which might arise in the Yukon district.

The American Position.—The American claim is presented in greater detail in an article by Professor J. B. Moore, published in October, 1899, of which the following is a brief summary: The most important point is the explanation of the expression "a line parallel to the windings of the coast," since the position of this line would determine the width of the strip along the coast which belonged to Russia under the treaty of 1825, and was therefore included in the purchase of 1867. The United States government, as has already been said, took this expression as meaning that the purpose of the treaty was to give Russia the control of all the coast of the mainland, including its indentations, and that the term "windings" included the heads of the inlets. Canada, on the other hand, claimed that the line was not meant to follow the actual windings of the coast, but to follow the general trend of the coast, cutting across the headlands of some of the bays and inlets, especially in the Lynn Canal, and giving Great Britain access to tide-water. The attitude of Russia and England at the time of the negotiation of the treaty throws light on the meaning of the articles in question, and this attitude is regarded as favorable to the claim of the United States. In the first place, it appears that the British government had its mind chiefly on the limitation of Russia's claim in 1821 to an exclusive jurisdiction over the Pacific Ocean, George Canning, the British secretary of state for foreign affairs, having expressly declared: "It is not on our

part essentially a negotiation of limits. It is a demand of the repeal of an offensive and unjustifiable arrogation of exclusive jurisdiction over an ocean of unmeasured extent." By settlement of limits it was expected that this claim would be overthrown for all time. The geography of the region was but partially known, and whether or not the mountain formed an unbroken line along the coast had not been ascertained. For that reason a general rule had to be adopted, instead of following the crest of the mountains, which might at any point run inland for an indefinite distance. The British representative first proposed, in 1823, that Cross Sound, lying about the latitude of $57^{\circ} 30'$, should form the boundary on the coast, and the meridian line drawn from the head of Lynn Canal should form the boundary in the interior. This was refused, and the British government then proposed a line through Chatham Straits to the head of Lynn Canal, thence northwest to the 140^{th} degree and along that degree to the Polar Sea. Russia, rejecting this, offered as a counter-proposition that the 55^{th} degree of north latitude should be taken as the southern limit, and that the line should "follow Portland Channel up to the mountains which border the coast" and from that point "ascend along those mountains, parallel to the sinuosities of the coast, as far as the 139^{th} degree of longitude (meridian of London)," and thence along that meridian to the north. The instruction which the British ambassador received from the government shows that the latter's main purpose was to prevent an extension of the Russian posts beyond a certain limit in the interior, lest it should break the continuity of the British territory. Russia's design, on the other hand, was to secure a base of support for the Russian-American Company by keeping control of a strip of territory along the coast, and, as an inducement to Great Britain to accept the line, the Russian government declared that British subjects should enjoy the free navigation of all the rivers which emptied into the ocean through this strip of coast. The British government objected to this on the ground that it would deprive Great Britain "of sovereignty over all the inlets and small bays lying between latitudes 56° and $54^{\circ} 45'$, whereof several (as there is every reason to believe) communicate directly with the establishments of the Hudson's Bay Company, and are consequently of essential importance to its commerce." Great Britain next proposed a line, which would give Prince of Wales Island to Russia, but cut her off from the adjoining coast of the mainland, and this proposal was rejected by Russia on the ground that the possession of Prince of Wales Island without a portion of the coast lying in front of that island could be of no utility whatever to Russia. Russia insisted upon the Portland Channel as the boundary of the southern portion of the line, but proposed that the eastern boundary should extend along the mountains which follow the sinuosities of the coast. After some discussion of the possible danger involved in assuming that the mountains always conformed to the windings of the coast, the compromise expressed in the last sentence of the fourth article was reached, and it was provided that the line should at no point be at a greater distance than ten marine leagues from the coast. On the maps which were in use for many years the line followed the windings of the coast, running around the heads of the inlets, and a further sign that this territory was regarded as belonging to Russia is the fact that the Hudson's Bay Company leased the greater part of this strip from the Russian government for many years after 1839. A line through the Portland Channel continued to be the undisputed boundary until about 1873, when some Canadian writers suggested that it should follow the Behm Canal, or take some other course than through the Portland Channel. The grounds for this were that by the terms of the treaty the line was to "ascend to the north" from the southmost point of Prince of Wales Island, while, in order to enter Portland Channel, it has to run to the east; and, secondly, that Portland Channel does not extend as far north as 56° north latitude, as is stated in article 3. In reply to these objections, it has been said that they seem to demand a greater accuracy and minuteness than the framers of the treaty had meant to employ. The language is a little loose, but its meaning is clear. The negotiators could not have meant the expression "ascend to the north" as requiring the line to run directly north from the southmost point of Prince of Wales Island, since in that case it would have deprived Russia of a portion of the island. Again, it is equally clear that the essential point of the words, "the said line shall ascend to the north, along the channel called the Portland Channel, as far as the point of the continent where it strikes the 56^{th} degree of north latitude," was the requirement that the line should run to the 56^{th} degree of north latitude, through the Portland Channel so far as that channel extended. The previous discussion has shown that Russia insisted upon the Portland Channel, and that Great Britain repeatedly tried to secure a different southern boundary, and that Russia's demand in this particular was finally granted. It appears, too, that Russia regarded the retention of this strip of coast as a return for giving up certain claims of jurisdiction and for making certain concessions in respect to trade, and also that the reason for her insistence





upon it was her desire to secure a protective base on the coast of the mainland for the establishments of the Russian-American Company on the adjoining islands.

ALBATROSS EXPEDITION. See ZOOLOGICAL STATIONS (paragraph Albatross Expedition).

ALCOHOL. *Consumption of Alcoholic Beverages in Various Countries.*—The most recent statistics give the average annual consumption in gallons of alcoholic beverages per individual as follows: England, beer, 30.31; wine, 0.39; spirits, 1.02; France, beer, 5.01; wine, 21.8; spirits, 1.84. Germany, beer, 25.5; wine, 1.34; spirits, 1.84. United States, beer, 12.3; wine, 0.44; spirits, 0.84. The consumption of whiskey in Great Britain for the fiscal year ending March 31, 1899, aggregated 34,334,421 gallons, or 0.852 of a gallon per inhabitant. Nine years before, the total reached was 29,850,523 gallons, or 0.747 of a gallon per capita. Besides this amount of proof-standard whiskey, there was a large amount of spirit manufactured for export, as well as methylated spirit, the total production by the distillers reaching the sum of 63,437,844 gallons. France, of all the European nations, consumes the largest amount of alcohol. According to the statistics presented at the Anti-Alcohol Congress, held in 1899, at Nantes, the requirements of France reach 14.19 litres of 100 per cent. alcohol annually for each inhabitant. In contrast with this figure, the Belgians and Germans were reported to consume yearly 10.50 litres per capita; the English, 9.25 litres; the Italians, 6.60 litres; the Swedes, 4.50 litres, and the Canadians, 2 litres per head.

Alcohol and Public Health.—It has been stated that the birth-rate diminishes in proportion as alcoholism increases. If this be true, the increase in the consumption of alcohol in France may account in part for her decreased birth-rate. Increase in insanity has been observed to keep pace with the increase in alcoholism in France. In 1838 there were about 15,000 inmates in the insane asylums of France. To-day there are about 100,000. In Paris alone the annual number of cases of insanity has increased from 7805 to 21,700 in thirty years. The cause assigned in 25 per cent. of these cases has been alcoholism. Suicides in France having their origin in alcoholism are becoming very frequent. In the North Department of that republic these suicides have increased sixfold. Dr. F. C. Busch, of Berne, is authority for the statement that statistics collected in 1899 from the fifteen largest cities of Switzerland, the population of which varies from 12,000 to 163,000, give the yearly average of deaths from all causes for the period from January 1, 1891, to January 1, 1898, as 7257. Of these, 465 deaths were ascribed as due to alcoholism. The highest percentage of deaths from this cause occurred in males between the ages of 40 and 59, at a time when a father is most needed by his family. Statistics for the first three months of 1898 showed a percentage from this cause of 15.1 of all deaths. The inmates of the twenty State insane asylums numbered 6164, while the population of Switzerland is a little over 3,000,000.

Influence of Season upon Alcoholism.—At the Seventh International Congress Opposed to the Abuse of Spirituous Liquors, held at Paris in April, 1899, Baer discussed the subject of season and drunkenness. He attributes the special prevalence of drunkenness in the summer season to a combination of influences, including, among others, the increased thirst due to the heat; the long days of mild weather, during which people meet more freely out of doors in social relations; the retarded bodily metabolism and deficient elimination of alcohol, and the fact that possibly the relaxation and fatigue of the brain peculiar to the heated term renders this organ more susceptible to the influence of alcohol. Somewhat at variance with Baer's theory is the fact that drunkenness is more common in cold and temperate countries than in the tropics. It is also more prevalent in damp than in dry climates. Baer mentions that suicide is more common in summer than at other seasons, as well as crimes against the person. The remedy suggested is the provision of suitable substitutes for alcoholic beverages during the heated term.

Alcohol in Therapeutics.—In an article published in Germany in June, 1899, Dr. R. Rosemann reviews the investigations of Riess, Stammrich, Miura, and Schmidt, which fail to show that alcohol controls in any way the loss of proteids. Until recent times alcohol has been considered by laity and faculty as a valuable nutriment, especially in acute fevers and other cases where there is rapid destruction of tissue and the desire exists to control this destruction by administering nourishment that is readily oxidizable. Rosemann made an experiment upon a well person, which satisfied him that alcohol causes a lessening to a very small degree of the daily loss of nitrogen under exhausting conditions; that alcohol controls the loss of fat to a considerable degree, and that the patient, while apparently remaining well nourished, is constantly losing muscle.

Alcohol and Crime.—Professor Pellmann, of the University of Bonn, has recently published the results of his investigations regarding the descendants of Ada Jurke, a chronic alcoholic, born 1740 and died 1800. Of her descendants, 7 were murderers,

76 committed other crimes, 144 were professional beggars, 61 were charges on public charity, and 181 were prostitutes. This family is said to have cost the German government \$1,200,000.

A recent interesting work on alcohol, presenting an earnest attempt to indicate the dangers of alcohol, and withal containing much interesting information, is *Shall We Drink Wine?* by Dr. John Madden, Milwaukee, 1899. See MARRIAGE, MEDICAL CONTROL OF.

ALEXANDER, Sir CLAUDE, major-general, died May 23, 1899. Born in London on the 15th of January, 1831, he was educated at Eton and at Christ Church, Oxford, and in 1849 entered the Grenadier Guards. He served in Crimea, being present at the siege and fall of Sebastopol. From 1874 to 1885 he sat in Parliament for South Ayrshire. He was created a baronet in 1886.

ALFRED, Prince, son and heir of the Duke of Saxe-Coburg and Gotha, Germany, and the grandson of Queen Victoria, died February 6, 1899, at the age of 25 years. His father is the second son of Queen Victoria and his mother the Grand Duchess Marie of Russia, daughter of the late Alexander II. of Russia. Prince Alfred was a captain of Prussian infantry and was unmarried. Through his death Prince Arthur, of England, Duke of Connaught, the third son of Queen Victoria, became the heir to the reigning dukedom of Saxe-Coburg. It was officially announced, however, on June 30, 1899, that the Duke of Connaught and his son, Prince Arthur, had renounced their claims to the succession in favor of the young Duke of Albany, son of the late Prince Leopold of England. The right to the succession is reserved by the Duke of Connaught in the event of the death of the Duke of Albany, or the extinction of the latter's male line.

ALGER, HORATIO, clergyman and famous writer of stories for boys, died at Natick, Mass., July 18, 1899. He was born at Revere, Mass., January 13, 1834. The three years succeeding his graduation at Harvard in 1852 were given to journalism and teaching. He subsequently passed three years at the Cambridge Divinity School, continuing at the same time his contributions to the press. In 1861 he travelled in Europe, and returning to Cambridge was engaged in private tutoring until 1864. In December of this year he was ordained pastor of the Unitarian Church at Brewster, Mass.; two years later went to New York, where he became interested in the social condition of street boys. It is probable that his observation here in large measure contributed to his subsequent writing of boys' stories. He lived in New York until 1896. Alger was a frequent contributor to periodical literature. His published volumes number about seventy, of which nearly 800,000 copies have been sold. These writings include the *Tattered Tom* series, the *Ragged Dick* series, the *Atlantic and Pacific* series, and the *Luck and Pluck* series. Among the individual titles of his works the following may be mentioned: *Bertha's Christmas Vision*, 1855; *Nothing to Do: A Tilt at our Best Society*, 1857; *Frank's Campaign; or, What a Boy Can Do*, 1864; *Paul Preston's Charles*, 1865; *Helen Ford, Adrift in the City*, 1895; *Frank Hunter's Peril*, 1896. He also wrote a volume of poems and lives of Webster, Lincoln, and Garfield.

ALGERIA, a French colony on the northern coast of Africa with an area of 184,474 square miles and a population, in 1896, of 4,429,421. The southern limits are somewhat loosely defined. The portion of the Sahara within these limits is estimated at 123,500 square miles, with a population of 50,000. One of the striking facts in regard to Algeria is that although the French have held the country since 1830 the size of the French element in the population is exceedingly small. In 1896 there were 318,137 French inhabitants, including naturalized citizens, while the foreign unnaturalized population numbered over 400,000. This fact has given rise to much discussion as to the probability that the alien element would finally dominate the country and some have even proposed a change in the electoral law which would prevent the foreigner from gaining this influence. The French and naturalized citizens have numbered at the last three censuses 219,071 in 1886; 272,662 in 1891, and 318,137 in 1896. The foreigners not naturalized increased only from 203,154 in 1886 to 211,580 in 1896, but a large part of the foreign element was included under the naturalized citizens. In the department of Oran it is estimated that four-fifths of the foreign population was composed of other elements than French. The commerce of Algeria is almost exclusively with France, but a large part of the imports pass by way of Algiers and through the desert into the Soudanese territory to the south of the Sahara. The chief articles of export are rushes, reeds, cork, iron ore, manufactured tobacco, tan bark, fodder, skins, and horses, and the principal imports are coffee, cattle, cotton, textiles, cereals, coal, tobacco, wood, and machinery. The value of the imports in 1897 was \$11,716,000, and of the exports \$9,601,000. This is exclusive of commerce with France, which in that year was as follows: Imports, \$45,412,900; exports, \$47,478,000. The chief sharer in the foreign trade of Algeria,

exclusive of France, was Great Britain. The chief products are barley, wheat, oats, olive oil, wine, tobacco, wool, iron, zinc ores, and phosphates. The minerals include lead, mercury, copper, and antimony. Petroleum occurs in Oran, and there are phosphate beds in some parts of the country. The wine production has shown a steady increase in recent years, amounting in 1898 to 140,000,000 gallons as compared with 12,000,000 gallons in 1880. Algeria is under a governor-general, who is in direct communication with the French executive, but the country is not regarded as a colony and has a distinct government of its own, with departments of finance, worship, justice, instruction, and customs, and a representation in the French National Assembly, to which it sends one senator and two deputies. The length of the railways is 2156 miles. The chief sources of revenue are direct taxes, customs, registration, stamps, and monopolies, and the main items of expenditure are included under the heads of ministries of the interior, public works, justice, worship, and instruction. The revenues regularly fall short of the expenditures, and the French government makes appropriations to meet the deficit.

ALLEN, CHARLES GRANT BLAIRFINDIE, was born in Canada in 1848, and died at London October 25, 1899. Grant Allen, as he was known from childhood, had a remarkably fertile literary career. For over twenty years he continued to produce volumes and magazine articles innumerable, varying in subject from light fiction to such weighty works as his *Evolution of the Idea of God*, published in 1897. As a novelist Grant Allen earned a well-deserved popularity. His *Philistia* and his *Babylon*, written respectively in 1884 and 1885, were such financial successes as to bring him a very large income, and they were the first of a long line of similar books. His success as a novelist was not altogether satisfactory to him, and he is said never to have been able to rid himself of the habit of looking with a kind of contempt on the art of novel writing. He frankly confessed in one of his collections of literary experiences that science was his only love, and fiction a pecuniary resource useful only from the standpoint of financial income. Yet his fame among readers at large may last longer on account of his novels than because of his philosophical and scientific works, in spite of his own preferences. His serious works were by no means dry, however. Indeed, they received an æsthetic treatment which made them very readable. And though in later years Grant Allen did devote more and more time to novel writing, he published many thoughtful studies on subjects on which he had not written before. Mr. Allen was a student of nearly all branches of knowledge and he was on terms of intimate friendship with many of the famous authors and artists of Great Britain. His *Physiological Æsthetics*, 1887, was dedicated to Herbert Spencer. In art his sympathies were with the pre-Raphaelites, and among artists Rossetti, Burne-Jones, and Holman Hunt were his friends. Of the long list of his productions the following may be mentioned: *Physiological Æsthetics*; *The Colour Sense*; *The Evolutionist at Large*; *Charles Darwin*; *The Colour of Flowers*; *Flowers and their Pedigrees*; *Force and Energy*; *Vignettes from Nature*; *Philistia*; *Babylon*; *Colin Clout's Calendar*; *For Maimie's Sake*; *In All Shades*; *The Beckoning Hand*; *The First Book*; *The Devil's Die*; *This Mortal Coil*; *White Man's Foot*; *The Tents of Shem*; *The Woman Who Did*; *Post-Prandial Philosophy*; *Strange Stories*; *Anglo-Saxon Britain*; *The British Barbarians*; *Science in Arcady*; *Miss Cayley's Adventures*; *The Evolution of the Idea of God*, and historical guides to Paris, Florence, Belgium, and Venice.

ALMA-TADEMA, Sir LAWRENCE, who was knighted in 1899, was born at Dronryp in the Netherlands January 8, 1836. He became a British subject in 1873, when he obtained letters patent of denization. His last work, "The Baths of Caracalla," was exhibited in 1899. He was also the English representative in the Vandyke festival at Antwerp. His home is in London.

ALSACE-LORRAINE, a territory acquired by Germany from France as a result of the war of 1870, now forms the Reichsland or imperial land of the German Empire, the German constitution having been introduced into the district on June 1, 1874. It has an area of 5601 square miles, with a population in 1895 of 1,640,986. The chief towns are Strasburg, the capital, with 135,608 inhabitants in 1895; Mülhausen with 82,986, and Metz with 59,794. In recent years attempts have been made to promote the industry and trade of the country and an industrial exhibition was held at Strasburg in 1895. In 1898 and 1899, however, it was reported that certain industries, especially the textile industries, were showing signs of decline. The exports of textile goods to the United States fell off rapidly, and the same movement was reported to be in progress in 1899. The administration is in the hands of a governor-general with the title of *Stadthalter*, Herman von Hohenlohe-Langenburg, appointed in 1894. He is the representative of the imperial government. Associated with him are the secretary of state, and a council of state, which consists of these two officers together with the principal provincial officials and from eight to twelve other members appointed by the Emperor. In 1899 there was much

discussion over the growing friendliness between France and Germany on the ground that it seemed to imply a disposition on the part of the former country to give up her long-cherished ambition for the recovery of Alsace-Lorraine, but the general opinion seemed to be that an *entente* between France and Germany upon matters in which the interest of both powers were identical would in nowise involve any ulterior designs which France might have upon Alsace-Lorraine.

ALUMINIUM. The production of the metal in 1898 amounted to 5,200,000 pounds, which was an increase of 30 per cent. over 1897, and 300 per cent. over 1890. In fact, the production has increased each year since the beginning of the industry in 1883. Bauxite still continues to be the important ore of aluminium, and the production in 1898 amounted to 25,149 long tons, valued at \$75,436. The output has increased steadily since 1893, and continues to come entirely from Georgia and Alabama. Some of the deposits in that region have given out, but on the other hand new ones have been discovered. During 1899 considerable exploiting was done in the Arkansas bauxite region, and a small amount shipped East.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. See ZOOLOGICAL SOCIETIES (paragraph American Association for the Advancement of Science).

AMERICAN ECONOMIC ASSOCIATION. See ECONOMIC ASSOCIATION, AMERICAN.

AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION. See MEDICO-PSYCHOLOGICAL ASSOCIATION.

AMERICAN MICROSCOPICAL SOCIETY. See ZOOLOGICAL SOCIETIES.

AMERICAN MORPHOLOGICAL SOCIETY. See ZOOLOGICAL SOCIETIES (paragraph American Society of Naturalists).

AMERICAN MUSEUM. See ANTHROPOLOGY IN AMERICA.

AMERICAN ORNITHOLOGISTS UNION. See ORNITHOLOGY (paragraph Organizations).

AMERICAN PSYCHOLOGICAL ASSOCIATION. See PSYCHOLOGICAL ASSOCIATION, AMERICAN.

AMERICAN SOCIETY OF BIRD RESTORERS. See ORNITHOLOGY (paragraph Organizations).

AMERICAN SOCIETY OF NATURALISTS. See ZOOLOGICAL SOCIETIES (paragraph American Society of Naturalists).

AMHERST COLLEGE, at Amherst, Mass., had a quiet but progressive year. The important event in the year's history was the choice of a new president in Dr. George Harris, of Andover Theological Seminary, an alumnus of Amherst. Dr. Edward Hitchcock served during the year as dean of the faculty, and at the following commencement he received from the college the degree of LL.D., and from the alumni a loving cup containing a bag of gold eagles "in grateful appreciation of his thirty-eight years of service to the college." The new treasurer of the college, Mr. J. W. Fairbanks, was active in promoting its welfare. No large gifts were received during the year. The Eno bequest of \$50,000 was paid in, and also \$10,000 from the Fayerweather estate. The movement begun by the class of 1884 to raise a fund of \$100,000 for a new college hall seems likely to result at an early date in a suitable assembly hall, which is much needed. A course on "Modern Governments and Their Administration" was opened under the direction of Professor E. A. Grosvenor, which will be developed and made a permanent feature of the curriculum. The additions to the library have been less than in previous years, amounting to 1553 volumes, making the total number now in the library 71,780. For statistics, see UNIVERSITIES AND COLLEGES.

ANÆSTHESIA. During 1899 the claims for the Schleich mixture (ether, chloroform, and benzine) have not been substantiated. Most anæsthetists who have used it agree that in cases in which it is used the percentage of cyanosis is high, and in several cases broncho-pneumonia has followed. The resultant vomiting has been about the same as that following ether. It is claimed that the after-nausea and vomiting, which are sometimes very depressing, and occasionally dangerous, may be prevented by the inhalation of vinegar immediately after the ether or other anæsthetic is discontinued. The resident physician of the Bay View Hospital of Baltimore, Md., reports that this use of vinegar has been successful in preventing nausea and also thirst, in about 97 per cent. of cases, during the past four years. Nitrous-oxide gas has been used increasingly during 1899 for examinations, removal of sutures, incision of abscesses, removal of tonsils and adenoids, reducing dislocations and fractures, and small operations, as well as a preliminary in the administration of ether or chloroform. It is safe and rapid, and leaves no after-

effects. It has the great disadvantage of not relaxing the muscles as other anæsthetics do. Early in the year Professor August Bier, of Kiel, introduced a method of producing extensive anæsthesia without unconsciousness by the introduction of a solution of cocaine (usually 0.5 of 1 per cent.) into the vertebral canal. The anæsthetic effects are believed to be produced by the action of the drug upon the nerves without sheaths and the ganglia which are found within the spinal canal. He has used this method in six major operations without any suffering to the patient or after-effects. Anæsthesia of the entire lower extremities and of most of the abdomen was secured in eight or ten minutes after the injection of about 0.005 of a gramme of the drug. In *Centralblatt für Chirurgie*, 1899, vol. xxvi., p. 1110, Seldowitsch reports the successful use of this method of anæsthesia in four major operations, in each of which he employed about 0.01 of a gramme of cocaine. The anæsthesia was sufficient for the completion of each operation, the longest lasting fifty minutes. A short time after the completion of each operation normal sensation returned. One patient, from whom a cancer had been removed, died of cancer five weeks after operation. Examination of the spinal canal revealed that no harm had been done by the lumbar puncture. See ACORN.

ANAM or **ANNAM**, a French dependency in Indo-China. It was formerly an empire, and its king was the feudal vassal of the Emperor of China, but, having appealed to France for protection in 1862 in order to put down a revolt in his dominions, he afterward had to give up several of his provinces to the French, and in 1884 his territory became a French protectorate. Anam is the official designation of the strip of land along the coast of the China Sea, with an area of about 81,042 square miles, and a population variously estimated at from 2,000,000 to 6,000,000. Its limits are ill-defined, but in 1893, by a convention with Siam, the river Mekong was taken as the western boundary. It is under the superior council of Indo-China, which advises as to the budget, and, with the other French possessions in Indo-China, it has been united since 1887 in a customs union. The interior affairs are administered by native officials under the control of the French government. The king is Thanh Thai, who was proclaimed in 1889. France receives the customs revenue. Three of the ports are open to European commerce. There is an army of 23,370, of whom 14,500 are natives. The work of the missionaries, which has been carried on for many years, has proved effective, and it is estimated that there are 420,000 Roman Catholics in the country. The Anamites occupy the towns and the coast lands, and tribes of Moïs are in the hill districts. Among the products are rice, maize, and other cereals, tobacco, sugar, cinnamon, mulberry, betel, manioc, the areca-nut, caoutchouc, dye, medicinal plants, bamboo, and other valuable timber. The manufactures include raw silk, crape, and earthenware. There are mines of iron, copper, zinc, and gold worked by the natives. The chief exports are sugar and cinnamon, and the chief imports are cotton goods, tea, petroleum, paper, and tobacco. The capital is Hué, with a population of 30,000. A garrison of French troops occupies a portion of the citadel. See **INDO-CHINA**.

ANATOMISTS, ASSOCIATION OF, AMERICAN, organized in 1888, in 1899 had 131 active and 10 honorary members. President, George S. Huntington, M.D.; secretary, D. S. Lamb, M.D., 800 Tenth Street, N. W., Washington, D. C. Annual meeting for 1900 at Washington, May 1-3.

ANCIENT ACCEPTED SCOTTISH RITE MASONS, the Supreme Council of Sovereign Grand Inspectors-General of the Thirty-third and Last Degree, had, on October 1, 1899, in the Northern Masonic Jurisdiction of the United States, a membership aggregating about 100,000, and the Permanent Fund and amount in treasurer's hands exceeded \$200,000. Grand commander, Henry L. Palmer, Milwaukee, Wis.; grand secretary-general, Clinton F. Paige, Binghamton, N. Y. Officers of the Southern Masonic Jurisdiction: Grand commander, Thomas H. Caswell, San Francisco, Cal.; grand secretary-general, Frederick Webber. 433 Third Street, N. W., Washington, D. C.

ANDREW AND PHILIP, BROTHERHOOD OF, organized in 1888, and in 1899 had 500 chapters, with 15,000 members distributed among 21 religious denominations. The *Brotherhood Star* is the organ of this society. President, the Rev. Dr. Rufus W. Miller; secretary, the Rev. C. E. Wyckoff, Irvington, N. J.

ANDREWS, General GEORGE LEONARD, died April 4, 1899, at Brookline, Mass. He was born in that State in 1828; was graduated at the Military Academy, West Point, in 1851. He served in the Civil War, rising to the rank of major-general of volunteers. From 1867 to 1871 he was United States marshal for Massachusetts; in the latter year he became professor of French at West Point, and in 1882 was appointed to the chair of modern languages. He retired in 1892.

ANGLICAN CHURCH, a general term including the Protestant Episcopal churches in all countries which have originated from the established church of

England. See ENGLAND, CHURCH OF; SCOTLAND, CHURCH OF; and PROTESTANT EPISCOPAL CHURCH.

ANGLO-AMERICAN COMMISSION. See CANADA (paragraphs on History).

ANGLO-AMERICAN LEAGUE. The Anglo-American League was formed in London in 1898 for the purpose of securing cordial and constant co-operation between the United States and Great Britain. Chairman of the Executive Committee, James Bryce, M.P.; secretary, Sir Frederick Pollock. Office, 6 King's Bench Walk, Temple, E. C., London, England.

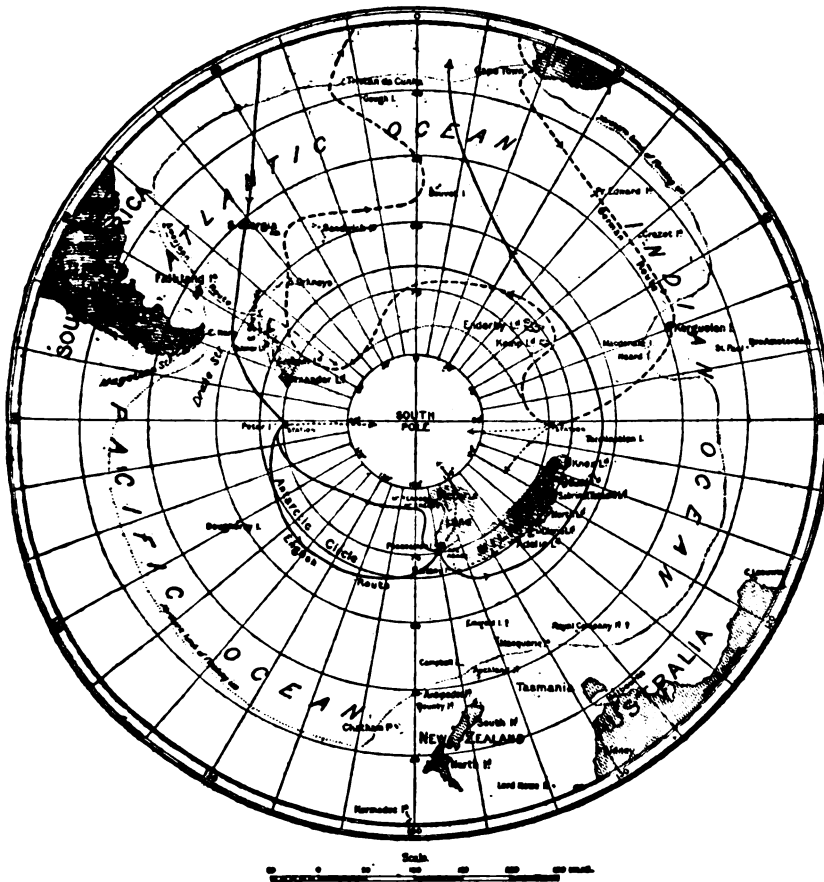
ANGOLA or PORTUGUESE WEST AFRICA lies on the western coast of the continent between the Congo Free State on the north and British Central Africa and German Southwest Africa on the east and south, with an area of 484,800 square miles, and a population estimated at 4,119,000. The capital is St. Paul de Loanda, and other important towns are Cabinda, Ambriz, Benguella, Mosamedes, and Port Alexander. The chief products are coffee, rubber, sugar, vegetable oils, cocoanuts, and ivory, and in the interior valuable mines of copper, iron, malachite, and salt are said to exist. Gold occurs in portions of the country, and a Portuguese commercial company organized with German capital has received important concessions, and is engaged in developing the mineral resources, especially the Cassinga gold mines, which have been recently discovered. Work is being done in developing the railways, and a line 250 miles long has already been constructed. It extends into the interior toward the line running from Portuguese East Africa westward, with which in time it is expected to unite, thus completing the railway route across the continent. There are also about 200 miles of telegraph line. The administration is in the hands of commissioners appointed by the Portuguese government, and there is a small army of 4000 men, of which 2058 are natives.

ANNENKOFF, General MICHEL, prominent Russian engineer, died in St. Petersburg, January 22, 1899. He was born in that city in 1838; through the influence of his father, also a general in the Russian service, he entered upon a military career. He fought against the insurgent Poles in 1866, and for meritorious services was promoted to the rank of colonel. During the Franco-Prussian War he accompanied the German army as a Russian military attaché. Having returned to Russia, he served under General Skobelev in the Merv campaign. Subsequently assigned to the engineering department, he became famous for his success in completing the great Trans-Caspian railway, begun by General Skobelev. General Annenkoff gave personal attention to the construction of the line between Samarkand and Tashkend. In recent years he was actively interested in the Trans-Siberian railway. It is said that, more than any other man, he was responsible for this great undertaking, and that his skilful setting forth of the plans for the road at Paris in 1891 secured for the enterprise the support of French capital.

ANTARCTIC EXPLORATION. In 1899 arrangements were made for the fitting out of a German Antarctic expedition. In England efforts were made by the Royal Society and the Royal Geographical Society. A private gift of £25,000 and a public subscription of £15,000 more were made for South polar exploration, and government aid was promised. The two expeditions of the year are treated in the following paragraphs.

The Belgian Expedition.—The Antarctic expedition which sailed in August, 1897, from Antwerp, in the 250-ton steam whaler *Belgica*, commanded by Captain Adrien de Gerlache, of the Belgian navy, arrived at Montevideo on its return voyage, April 4, 1899. The party left Punta Arenas, on the Straits of Magellan, December 14, 1897, and just a month later sailed from Staten Island, east of Terra del Fuego, for the South Shetland Islands. Other islands were discovered and the geographical knowledge of the South polar seas was considerably extended. Hughes Bay, on the west side of Palmer Land, was reached on January 24, 1898, and from that date to February 12 an adjacent archipelago was explored. Three species of small insects found here are the first Antarctic land fauna known. On February 16 Alexander I. Land was sighted, but near approach was prevented by an impenetrable ice-floe. On March 3, when a point 71° 31' S. and 85° 16' W. had been reached, the ice made further progress impossible, and for a few days following the *Belgica* drifted in the midst of a mass of ice. On March 10, 1898, the ship was completely blocked, and from that date until March 14, 1899, was imprisoned in the ice-pack. In 1898 the sun set on May 17 and did not rise again until July 24. The members of the expedition were the first men to live within the Antarctic circle during the polar night. On May 30, 1898, the ice-floe surrounding the *Belgica* had drifted so that the ship had reached a point 71° 36' S. and 87° 38' W.; this was the southernmost latitude attained by the expedition. During these months of the south polar winter the heavy snowstorms, the violence of the wind, and the treacherous

An outlet opened in October, 1898, about three-eighths of a mile from the ship. About the 1st of the following January Captain de Gerlache attempted to dig a channel to the outlet, but the latter soon closed up. During these last weeks of her imprisonment the *Belgica* suffered dangerously from ice pressure. When the ice-pack finally opened on March 14, 1899, the ship was a trifle over 70° S. and about 103° W. The land that has been charted as 70° S. and 100° W. was not seen. The ship reached Punta Arenas on March 28 and Montevideo on the 4th of April.



SOUTH POLAR REGIONS—SHOWING ROUTES OF THE PROPOSED ANTARCTIC EXPEDITIONS

The British Expedition.—The Antarctic expedition, organized by Sir George Newnes and commanded by Mr. Carsten Egebert Borchgrevink, sailed from the

Thames in the wooden vessel *Southern Cross* in August, 1898, and on December 19 stood south from Hobart, Tasmania. On December 30 the first ice was encountered in latitude $61^{\circ} 56'$ S. A few days later the ship came in sight of the Balleny Islands, and there was caught in the ice-pack and held for over a month. Having finally pushed through, the party sighted high land on February 15, 1899, and on the 17th reached Robertson Bay, near Cape Adare, Victoria Land, which seems to be not far from 70° S. and 170° E. The landing was rendered dangerous by heavy gales, but equipments, provisions, building materials, and seventy-five Siberian dogs were safely brought to shore. The construction of a house, which was immediately begun, was completed on February 28, at which time the *Southern Cross*, leaving Mr. Borchgrevink and nine companions, put about for New Zealand, reaching Port Chalmers on March 16. Before the return of the ship three of the party attempted to climb a mountain near at hand, from which a view of the country could be obtained; they could not get above 2300 feet, but found that the country is undulating and covered with glacier ice. While in 1898 the members of the Gerlache expedition were the first to pass the season of the polar night within the Antarctic circle, the Englishmen under Borchgrevink in 1899 were the first to pass the dark season on Antarctic land. As the expedition was thoroughly equipped, both for exploration and for technical scientific research, good results are hoped for. It was expected that the *Southern Cross* would return to Cape Adare in January, 1900.

ANTHRAX. See INSECTS; SERUM THERAPY.

ANTHROPOLOGY IN AMERICA. The increasing interest in anthropology and its allied sciences during the past year, as evinced by the establishment of university chairs of anthropologic instruction, the organization of historical and antiquarian societies, the efforts for the conservation of the ancient monuments, the enlargement of museum facilities, and the substantial donations by wealthy patrons for the furtherance of collection and expeditionary research, has been most gratifying to all students who desire to see the study of man take its proper place in the forefront of the sciences. Many university establishments in the United States now make some provision for regular anthropologic instruction, the most recent additions being Yale, which has instituted a course in anthropology under Professor George Grant MacCurdy, and Columbia University of New York City, where a chair has just been created, filled by Dr. Franz Boas, of the American Museum of Natural History.

One of the important results of the forty-eighth annual meeting of the American Association for the Advancement of Science, held at Columbus, O., in August, was the appointment by Section H of a committee, with Professor W. J. McGee as chairman, for the special purpose of devising means for the further extension of anthropologic study in the higher educational institutions throughout the country. As ethnologist in charge of the Bureau of American Ethnology, Professor McGee has already done notable work in that direction, not alone in organizing and directing investigation, but also in arousing popular interest in the subject, particularly by the formulating of the science upon a broad working basis in a series of public lectures delivered in the early part of the year at the Iowa State University, in Iowa City. Another important committee appointed at this meeting was that for the conduct of investigations relating to the white race in America. Of special interest was the address of the retiring president, Professor F. W. Putnam, being an argument for distinct racial types in prehistoric America, and a study by Professor Mansfield Merriam upon the increase of viability in the United States. A field excursion was made to the celebrated prehistoric earthworks at Fort Ancient. Memorial proceedings were also held upon the death of Dr. D. G. Brinton. The association adjourned to hold its next annual meeting at New York in June of 1900.

The regular holiday meeting of Section H and the American Folklore Society was held in conjunction with that of the Archaeological Institute of America, and a number of affiliated societies, at Yale University, New Haven. As usual in the joint assemblies, the papers covered a wide range of interest from archæology and anthropometry down to the lighter folklore.

The South has recently manifested an awakening interest in all that relates to her past. In South Carolina the State Historical Society, which had lain dormant for many years, has taken on new life, and is contemplating the publication of a quarterly periodical, to be filled chiefly from the valuable manuscript documents in possession of the society and the State archives. The quarterly publication of the Southern History Association, with headquarters at Washington, already stands in the front rank among its kind. The General Assembly of Alabama has recently provided for the appointment of a history commission, to act in conjunction with the State Historical Society in the systematic collating, preservation, and ultimate publication of all that relates to the antiquities of the State. In Texas, the State University, at Austin, which has recently come into possession of that immense

collection of invaluable manuscript material, formerly known under the title of the "Archives of Bexar," has issued an appeal for assistance toward making its contents available by translation and publication. In Colorado the State Federation of Women's Clubs has taken up the subject of the preservation of the remarkable cliff ruins in the southwestern portion of the State, and is actively pressing for State or Federal legislation in the matter. The Arizona Antiquarian Association is doing similar work within its own territory.

While the work goes steadily onward, one by one the workers drop out of the ranks, and within a year science has been called to mourn the loss of Brinton, Coves, Dawson, Ernst, Hoffman, and Valentini.

Smithsonian Institution, National Museum, and Bureau of American Ethnology, Washington.—The past year has been one of unprecedented advance in all branches of the government establishment. Under the energetic administration of Professor W. H. Holmes the entire department of anthropology—by far the largest and most important of the National Museum—is being overhauled and systematized, new halls and galleries have been thrown open to the public, and a number of important collections have been added by purchase or field exploration. Under the present arrangement the archæologic material is displayed in the Smithsonian building proper under the supervision of Dr. Thomas Wilson, curator of prehistoric archæology, while all other ethnologic material, including collections made by the field collaborators of the Bureau of American Ethnology, is housed in the National Museum, under direct charge of Dr. O. T. Mason, curator of ethnology.

In archæology a valuable acquisition has been made in the Steiner collection of objects from the great Etowah mound and from ancient village and quarry sites in Columbia County, Ga. The noted Guesde collection of stone implements from the island of Guadeloupe has also been acquired and constitutes a wealth of material for the study of the art and custom of the ancient Carib tribes. An interesting and valuable series of ancient Peruvian skulls, showing prehistoric trephining, collected by the late Dr. M. A. Mufiz, has also been secured. These skulls have been described by Professor W. J. McGee in the sixteenth annual report of the Bureau of American Ethnology. Through the courtesy of G. W. Brackenridge, Professor Holmes was enabled to visit the ancient obsidian quarries in the vicinity of the City of Mexico, and obtained valuable material illustrative of this class of Aztec manufacture.

On an expedition into Mexico, extending as far south as Oaxaca, Dr. Walter Hough, assistant curator of ethnology, in company with Dr. J. N. Rose, made a fine collection of plants illustrative of Mexican ethno-botany.

A valuable old collection of more than one thousand pieces, obtained from the northern plains tribes by Mr. Emile Granier, has been acquired by purchase, and a splendid series of nearly five hundred baskets from the Pomo and other tribes of northern California, collected originally by Dr. W. J. Hudson, of Ukiah, was secured by Professors Holmes and McGee as one result of a former Californian expedition. This collection is of special importance for its beauty of workmanship and the wealth of symbolic decoration. From Cuba and Puerto Rico a number of Spanish war relics and implements belonging to the daily life of the people was obtained by Mr. Paul Beckwith; Dr. W. H. Dall, of the recent Harriman Alaskan expedition, brought back some Tlinkit material; and from South America has been obtained through Professor J. B. Hatcher a large collection of ethnologic material of the Tehuelche and Yahgan tribes of central and southern Patagonia. A fine Tarumari mummy, taken from a burial cave in the Sierra Madre, of Mexico, by Mr. James Mooney, has been placed on exhibition in the Pueblo Gallery, and valuable additions have also been made to the Colonial and Revolutionary department.

Among the extra-American additions must be noted a small collection from Luzon, by Dr. G. F. Becker, including among other things two Negrito skeletons, and a fine series from the tribes of the upper Congo region, Central Africa, secured by the Rev. S. P. Verner.

Monographs on the various collections, written by Smithsonian experts or collaborators, are published in the annual reports and occasional bulletins of the Smithsonian Institution and National Museum, all the illustrations for these papers being prepared from photos made in the photographic department of the museum in charge of Mr. T. W. Smillie. Through the assistance of the International Bureau of Exchanges these publications are distributed without cost to educational establishments and students in every part of the civilized world. The most recent monograph publication is a memorial upon Indian pipes, by Mr. J. D. McGuire, a Smithsonian collaborator, based upon a study of museum material.

The field explorations of the Bureau of American Ethnology during the past year have been carried on from Nova Scotia to Arizona, the scientific results being embodied in the papers of the annual reports of the bureau, while the tangible col-

lections, as already noted, are deposited in the anthropologic department of the National Museum. Dr. J. W. Fewkes continued his observation of Hopi ceremonies and exploration of ancient Pueblo sites in northern Arizona, and was still in the field at the close of the year. Professor J. B. Hatcher, a special agent of the bureau, whose valuable collections from Patagonia have been mentioned, also continued operations in the same field. During the summer season the director, Major J. W. Powell, accompanied by Mr. F. H. Cushing, made exploration of the mounds and shell-heaps along the coast of Maine, unearthing many relics of antiquity, not the least interesting of which was a portion of a suit of armor found in one of the graves. Dr. A. S. Gatschet made further linguistic and ethnologic researches among the Micmacs and cognate tribes of northern Maine, New Brunswick, and Nova Scotia; Mr. J. N. B. Hewitt made further extended studies of the Iroquois tribes both in New York and in Ontario; and Mr. F. W. Hodge, in company with Mr. G. P. Winship, for the American Museum of Natural History, and Dr. Elliott Coues, made a flying trip to the Rio Grande Pueblos, securing valuable ethnologic material and a fine series of several hundred photographs illustrating Pueblo life. During the summer season Dr. A. E. Jenks, as collaborator of the bureau, made extended investigation of the wild-rice industry among the Winnebagoes, Menominees, and Ojibways of the upper lake region. Toward the close of the year Mr. James Mooney, in prosecution of his study of the South Atlantic tribes, made an exploration of tide-water Virginia and Carolina, resulting in the discovery of five still existing tribal bands in Virginia, besides others in North and South Carolina. He also made some study of manuscript documents in possession of the Georgia Historical Society at Savannah. The photographic collection of the bureau has recently been enriched by the transfer from the Bureau of American Republics of a splendid series of photographs illustrating race types, scenes, and customs in Mexico, Central America, and South America.

The Peabody Museum.—Late in November the Peabody Museum of American Archaeology and Ethnology, in Cambridge, Mass., sent out an expedition to Honduras in charge of Mr. G. B. Gordon. Among the more important additions to the museum made during the year are a series of casts from Yucatan and Central America, with photographs by Maler of ancient sculptures of Guatemala; a collection of ancient remains of the Massachusetts tribes; the valuable Kimball ethnologic collection, formerly exhibited in the Boston Museum Theatre; a fine Samoan collection, including an outfit for preparing tapa cloth; a Malay collection from Singapore, made over fifty years ago; and a fine series of Indian and Polynesian pictures, including a number of copies of paintings in oil.

Considerable additions were made to the library, among them being fac-simile reproductions of the codices Telleriano-Remensis and Messicano di Bologna. Miss Alice C. Fletcher has continued her studies of Omaha and Pawnee rituals, and Mrs. Zelia Nuttall will soon publish, as No. 7 of the Museum Papers, a memoir entitled *The Keynote of Ancient American Civilizations*, embodying the results of several years of research.

The American Museum.—During the year just ended the American Museum of Natural History, in New York City, has well maintained its position in the front rank of museum establishments for the extent, value, and systematic arrangement of its collections and the enthusiastic industry of its collaborators.

The recent work of the Jesup North Pacific expedition, organized some years since for investigation on both sides of the North Pacific, has been particularly notable and fruitful of results. In the Puget Sound region, Vancouver Island, and British Columbia, Dr. Harlan I. Smith, for this expedition, made important explorations of shell-heaps, cairns, and other sepulchral remains, together with anthropometric investigations, with a view to the determination of possible routes and limits of Asiatic influence from the coast into the interior. James Teit and George Hunt, the former already well known from his previous work, continued researches in British Columbia. On the Asiatic side Dr. Berthold Laufer, who left New York in May, 1898, under the auspices of the same expedition, continued his investigations in the Amur region and on the island of Saghalin, securing important collections and much valuable ethnologic and linguistic material from the Aino, Gilyak, and some other tribes of that almost unknown region. His anthropometric efforts were somewhat hampered by the superstitious fears of the natives. Contrary to popular impression, he finds the Aino not excessively hairy and does not think the type homogeneous. The Jesup collections in the museum are separately displayed in the "Northwest Coast Hall," now open. One brochure, upon the archaeology of Lytton, British Columbia, by Dr. Harlan I. Smith, has appeared during the year as the most recent publication of the results of the expedition, and other memoirs upon the ethnology and archaeology of the same general region are promised in the near future. The field work will also be continued under competent direction both along the northwest coast and in Siberia.

Another recent acquisition is an invaluable collection by Captain George Comer from a primitive tribe of Eskimo on Southampton Island, in Hudson Bay, living entirely cut off from communication with their own stock upon the mainland, and never before visited by white explorers. Owing to their complete isolation and the lack of ordinary working material, their home life and arts are particularly interesting subjects of study.

Within the United States archaeological work has been carried on by Saville and Harrington along the Mohawk and lower Hudson Rivers and Long Island Sound. The Hyde expedition prosecuted excavations at the Pueblo Bonito ruins in Colaco Cañon, northwestern New Mexico, under Pepper, Hrdlicka, and Dodge, Professor Putnam making a short visit to the same locality, and the work will be continued during the ensuing year. Mr. George Parker Winship, accompanying an expedition sent out by the Bureau of American Ethnology, made valuable pottery collections among the Pueblos. Mr. R. B. Dixon made extended ethnologic investigations in California, under the auspices of the Huntington fund, which will be continued during 1900. These collections, with others, are now displayed in the General Ethnologic Hall, just opened.

The valuable collections from Mexico and Central America, the fruit of years of excellent field work, backed by generous patrons, is now displayed in the Mexican Hall, formally opened in December. Regarding this immense repository of originals, casts, and manuscript fac-similes illustrative of the extinct Maya and Aztec culture, it is only possible here to endorse the testimony of an expert witness that it is "the most important collection in existence for the study of the ancient civilization of Mexico and Central America." A bulletin embodying some of the results of the most recent Mexican explorations is expected shortly.

In South America, Bandelier continues his explorations, begun some years ago, among the Aymará ruins of the Titicaca region, and the tangible results are now installed in the Peruvian Gallery.

The usual free lecture course by museum specialists has been kept up through the winter season. Important additions have been made to the museum building, which is planned upon a scale that, when completed, will make the finest in America.

University of Pennsylvania, Philadelphia.—The event of the year in the record of this institution was the opening of the new museum. Under the efficient supervision of Professor Stewart Culin, curator of general ethnology, there have been placed on exhibition the Frishmuth collection of musical instruments, a recent gift comprising more than one thousand specimens; the Drexel fan collection, another late acquisition; several collections from Borneo, and the Williams collection from Morocco. A part of the Asiatic material has also been installed, but several important series, with a great wealth of general ethnologic material, are still awaiting room space. Other recent acquisitions, in addition to those already named, are the Sommerville East Indian collection; the Spanish-Filipino arms collection obtained in Spain by the curator in 1892-93; valuable faience presented by Mrs. William Pepper; the McIlhenny collections from Point Barrow graves, and the Dickeson mound collection. Space has been assigned in the basement to a collection relating especially to local history.

There have also been arranged in the new building selections from the Hearst collections from the southwestern cliff ruins; the Uhle collections from the ruins of Pachacamac, Peru, obtained through the liberality of the late Dr. William Pepper; the Cramp collection of Central American pottery; the Lumholtz collection from Chihuahua, and a valuable loan collection of jade and other stone objects from Costa Rica, together with the Loubat Aztec fac-similes and synoptical groups illustrating primitive developments. The recently established lectureship of American Archaeology, under Professor Culin, will render these collections of constantly increasing value.

In the Egyptian section, in charge of Mrs. Cornelius Stevenson, valuable collections, of unquestionable authenticity and approximately certain date, have been added, which illustrate the development of civilization in the Nile valley from the earliest period up to Græco-Roman times. Particularly noteworthy is the Egyptian Pantheon exhibit. Of kindred interest is the Mediterranean collection, made possible by the generosity of Mrs. Phoebe Hearst and the Hon. John Wanamaker, embracing objects from Cyprus, Greece, Southern Italy, and the Etruscan tombs, some of the latter dating back nearly three thousand years.

The priceless collections in the Babylonian and General Semitic Section, under the curatorship of Dr. H. V. Hilprecht, are chiefly the results of the excavations so long conducted at Nippur under the auspices of the Babylonian Exploration Fund, and includes objects covering a period of six thousand years, reaching backward almost to the very dawn of civilization.

Two museum bulletins have been published during the year. Important additions have been made to the library, and the university has maintained a course of

lectures on archæology and paleontology, including free lectures in outside cities by university specialists.

Ohio State Archæological and Historical Society, Columbus.—This society is doing splendid work for the preservation and scientific exploration of the antiquities of the State, some of which are well known as the most remarkable east of the Mississippi. The great earthworks at Fort Ancient have been placed by the State Legislature in the care of the society, which is now making the place conveniently accessible to students. The Serpent Mound Park has also been turned over to the society by the trustees of the Peabody Museum. The prehistoric remains at Newark are already under State care. During the past year the society has carried on explorations at the ancient "Baum village site" on Paint Creek, the results of all field work being published in its quarterly journal, while the curator, Professor W. C. Mills, conducts a course of class lectures on anthropology at the State University.

Field Columbian Museum, Chicago.—This rapidly growing institution is closely affiliated with the University of Chicago, which conducts a course in anthropology, and co-operates with it in all work in that direction. During the past year important accessions have been made through the efforts of Dr. George A. Dorsey, curator of the department of anthropology, who made three collections in the field, one among the Pomos of Northern California, another with the Salish tribes of Washington, and a third, jointly with Rev. H. R. Voth, at Oraibi Pueblo, Arizona. Other collections made by Mr. Dorsey include archæologic material from Union County, Ill., and from the Peoria reservation in Indian Territory. In line with this is a recent acquisition of flint implements from Illinois, and a prehistoric series from Ohio. A fine archæologic collection from Pasadena, Cal., was presented by Mr. H. N. Rust, and the department of Mexican archæology was greatly enriched by donations from Mr. E. E. Ayer and Mr. M. A. Ryerson. The former also donated a series of Mexican baskets and pottery, and a number of baskets from the Pomo tribes, while Mr. W. D. Gates donated ancient pottery from southern Alabama. Large accessions were made from the plains tribes—the Cheyennes, Arapahoes, Comanches, and Sioux—and several life-size groups were added to the Eskimo department.

Most important work was done in the Hopi department, based chiefly upon collections obtained at Oraibi Pueblo by Rev. H. R. Voth, and presented to the museum by Mr. Stanley McCormick. The material includes a splendid series of masks, figurines, dance-staffs, ceremonial paraphernalia, pottery, and household equipments, classified and labelled according to a very exact system by Mr. Voth, who has also supervised the preparation of several life groups illustrating Hopi custom and ceremonial, together with a number of altars and sand mosaics, which were explained in a lecture delivered by him in connection with the museum lecture course. Additional material was obtained by Mr. Voth on a recent trip.

The Italian collection has been largely increased by purchase through Mr. E. E. Ayer of antiques in stone, gold, and pottery, with a number of mural decorations from the villa of Hadrian. Important additions also have been made, through the same channel, to the Egyptian collection, including a number of mortuary tablets, the labels for which have been prepared by Dr. Breasted, professor of Egyptology at the University of Chicago. A fine collection of bronzes has been procured from Benin, West Africa; and from Brandon, England, has been obtained an interesting series illustrating the manufacture of gun-flints. The valuable Umlauf collection of jade objects from Korea was presented by Mr. H. N. Higinbotham. A unique specimen of Korean art, the gift of Mr. James Horton, is a bed embroidered by the ladies of the Korean court, and by them presented to Miss Horton.

The Davenport Academy of National Sciences, which already possesses one of the most valuable prehistoric collections in the West, has but little new to report for the past year, but the purchase of an additional building site promises to afford enlarged facilities in the near future.

The Colorado State Historical and Natural Society, with headquarters in Denver, under the curatorship of Professor William C. Ferril, now occupies with its museum and library twelve rooms in the Capitol building, three of which are devoted to the invaluable Wetherell and Willmarth collections from the Mancos ruins, constituting the largest exhibit of prehistoric Colorado ethnology in the world. During the past year this department was visited by more than 60,000 people. The society being entirely a State institution, its collections are strictly limited to the things of Colorado. A special educational feature is a series of lectures upon Colorado subjects, given in the museum rooms to the teachers and pupils of the city schools by the curator, and illustrated from the collections. Some years ago the society began an effort looking to the conservation of the remarkable cliff ruins of the State, through proper legislation. In consequence of this impulse, the State Legislature has twice memorialized Congress to reserve the Mancos region as a national park, and the

matter has recently been taken up with fair prospects of success by the State Federation of Women's Clubs, through a committee of which Mrs. Gilbert McClurg is chairman. Important explorations have lately been made in the same region by Captain Cecil A. Deane, who reports the discovery of an extensive area literally covered with the remains of stone houses.

The Arizona Antiquarian Association, organized in 1895, has been incorporated during the last year, with headquarters at Tempe, with Dr. J. Miller as president, and Dr. James McNaughton as secretary. Its objects are to collect materials for a museum of prehistoric antiquities, to make study of the ancient monuments, and to protect and preserve them from vandalism. About 3000 museum specimens have already been secured, and good work has been done toward protecting some of the most noted ancient remains. Members are also making valuable studies of the general ethnology of the existing tribes of the Territory, with a view to ultimate publication of the results.

The Golden Gate Park Museum, San Francisco, with Professor C. P. Wilcomb as curator, has received a number of accessions during the year, the whole number of specimens of all kinds now in the museum, including loan collections, being about 50,000. A valuable feature is a complete series of fine oil paintings of the old missions, painted by H. C. Ford, the artist, before any of them had been much injured by decay. Owing to the limited funds, few large purchases or field explorations can as yet be undertaken, but the energetic curator has himself made several extended visits among the northern tribes of the State, securing valuable ethnologic material of a kind that is rapidly disappearing. The interior arrangement and classification system of the museum has been much improved, and the establishment is now on a better working basis than ever before.

Ontario Archaeological Museum, Toronto.—This institution, under the efficient curatorship of Professor David Boyle, is doing excellent work in its own field. Among the operations of the past year are a series of explorations by the curator of mounds upon Pelée Island, in Lake Erie; by Mr. G. E. Laidlaw, of ancient village sites in Victoria County; by Mr. W. J. Wirtemberg, in the old Attiwandaron country of Oxford County, and by Mr. A. F. Munter, in the old Huron country. In regular ethnology considerable attention has been given by Mr. A. F. Cringan to the collecting of songs and music of the pagan Iroquois of the Tuscarora reservation. These songs, with much other ethnologic and linguistic material, will be embodied in the annual report of the curator. The museum now counts 2300 specimens, of which more than 2000 have been added during the year, among them being a number of valuable Aztec relics, the gift of Mrs. W. Stuart. It is visited annually by many thousands of persons, and there is abundant evidence that popular interest in the subject is in a healthy condition.

Latin-America.—The several museums and kindred institutions in Mexico, Central America, and South America seem to be nearly at a standstill so far as anthropologic work is concerned. No field exploration is reported, and the chief ethnologic result for the year appears to be the publication by the *Museo Nacional de Mexico* of some manuscripts relating to the Indians, written about the middle of the seventeenth century. Dr. Nicolas Leon, the well-known ethnologic student of the City of Mexico, is also at work upon a study of the Tarasco Indians, which may in time be published under government auspices. The recent death of Dr. Ernst, for a long time the director of the *Museo Nacional* of Caracas, Venezuela, is a severe loss to science in South America.

ANTIGUA, an island of the West Indies, constituting with its dependencies, Barbuda and Redonda, a presidency of the British colony of the Leeward Islands (*q. v.*). The area of Antigua is 108 square miles and of the dependencies 62 square miles; the population of the three is about 37,000. The crown colony system of government was instituted in March, 1898. The capital, St. John, with a population of nearly 10,000, is also the seat of government for the Leeward Islands colony. The chief product is sugar, the export in 1897 amounting to £101,106, but other exports are pineapples, molasses, rum, tamarinds, and arrowroot. The following statistics are for 1898: imports, £43,829; exports, £79,178; revenue, £39,663; expenditures, £55,586; public debt, £137,474. The aggregate entrances and clearances in foreign shipping in 1897 amounted to 445,948 tons.

ANTI-IMPERIALIST LEAGUE, NEW ENGLAND, was organized in Boston, November 19, 1898, and in 1899 had a membership of 50,000. It is estimated that since its organization about a hundred Anti-Imperialistic societies have been formed in the United States, notably in New York, Philadelphia, Chicago, Springfield, Cincinnati, Washington, D. C., Los Angeles, Portland (Oregon), and Minneapolis. The aim of the society is to oppose the jurisdiction of the United States over the Philippines. President, George S. Boutwell; secretary, Erving Winslow, 44 Kilby Street, Boston, Mass.

ANTIMONY. The American ore mined in 1898 amounted to 697 short tons, and was about 20 per cent. of the total quantity smelted in this country, as the foreign countries are still our important source of supply. The increased demand for antimony was due to the greater use of copper, zinc, and lead, with which it is mixed to form alloys. The development of the antimony industry in this country has been remarkable, and the production of metal in the United States has increased from \$12,000 between 1880 and 1886 up to \$184,050 produced in the year 1898 alone.

ANTISEPTICS. See ASTEROL.

ANTITOXIN. See DIPHTHERIA; SERUM THERAPY.

ANTIVACCINATIONISTS. See SMALLPOX.

ANTIVENENE. See SERUM THERAPY.

APPALACHIAN MOUNTAIN CLUB, organized in 1876 to preserve the beauty and attractiveness of mountain resorts, and to collect scientific data concerning the mountains of New England and adjacent States. In 1899 there were 1165 members. It publishes *Appalachia*. President, Albion A. Perry; corresponding secretary, John Ritchie, Jr., Box 2795, Boston Mass.

APPLETON, WILLIAM HENRY, senior member of the publishing house of D. Appleton and Co., New York, born 1814, died October 19, 1899, was the last of the men who had built up the older houses which made New York a publishing centre. The part which he took in developing the business founded by his father, Daniel Appleton, was a conspicuous one for over sixty years. He began in 1825 as a clerk in his father's bookstore, New York. Five years later he was sent to Europe, where he displayed his business sense by buying on his own responsibility one thousand copies of an expensive holiday edition of a work just issued by Longman. The books were quickly bought up by the trade in America, and the venture proved successful. On a subsequent business trip abroad, during the course of which the panic of 1837 came on, his judgment in carrying out his mission probably saved his father's firm from falling in the general ruin. In the following year, at the age of twenty-four, he was taken into partnership with his father, becoming the head of the firm in the latter's retirement. In this capacity he was active in pushing the publication of the new *American Cyclopædia*, edited by Charles A. Dana and George Ripley, and introducing the works of Darwin, Huxley, Tyndall, and Spencer to the American public. From this class of publications the *Popular Science Monthly* naturally developed. Mr. Appleton also brought out Webster's Spelling Book, whose circulation was in the millions. Other of his enterprises were Benton's *Thirty Years in Congress*, Disraeli's *Lothair*, *Picturesque America*, McMaster's *History of the People of the United States*, and the *Annual Cyclopædia*, founded in 1861. He retired from active work several years ago. Mr. Appleton was prominent in the struggle for an international copyright. He was a trustee and director of various important business and charitable institutions and a prominent clubman.

ARABIA, a large peninsula in southwestern Asia, lying to the east of the Red Sea. Its estimated area is 1,230,000 square miles, though some accounts give it at 1,000,000 square miles, and the estimates of population range from 4,000,000 to 12,000,000, the lower estimates being the most recent. It comprises the two Turkish provinces of Hedjaz and Yemen and a tract which is under British influence. The latter includes the state of Oman in the southeastern part of the peninsula and extending along the coast for nearly 1000 miles. There have been friendly relations between the Sultan of Oman and the government of India for many years, and a British consul or political agent resides at Muscat. On the western coast also there is the British dependency of Aden (*q. v.*), which is subject to the Bombay government. Central Arabia is independent, being occupied by Arab tribes, which acknowledge no single ruler. Turkish rule does not penetrate much beyond the strip of land along the coast of the Red Sea and the Persian Gulf. In the two Turkish provinces of Hedjaz and Yemen the population is estimated at 1,050,000, and the combined area is 173,700 square miles. An Arab insurrection was reported in Yemen in 1898, and it continued during part of the succeeding year. Its origin was attributed partly to race hatred and partly to the taxes imposed by the Turks upon pilgrims to Mecca. It started in the district of Assir, it is said, under the leadership of Ben Hamid. The Turks defeated the rebels toward the end of November, 1898, at Shenel, inflicting a loss, estimated at 4000, and losing about one-half that number themselves in killed and wounded. Another engagement took place in December, 1898, between Hodeida and Sana. In April, 1899, it was reported that the insurgents had gained advantages over the Turkish forces, and later, in the middle of May, that the Turkish commander, Abdullah Pasha, had been obliged to retreat to Sana after suffering heavy losses. Some account of the international conflicts between France and England, arising out of the former power's

attempt to obtain a harbor in the dominion of the Sultan of Oman, north of Muscat, is given in the article on France (*q. v.*).

ARBITRATION, INTERNATIONAL. See HAGUE CONFERENCE.

ARBITRATION, LABOR. In several States of the United States the laws provide for boards of arbitration and conciliation in labor disputes. The decisions of these boards are not binding, but are meant to bring to light the facts concerning matters in dispute and to insure, by every possible means, the maintenance of industrial peace. The principle of compulsory arbitration, which would render the decision of the board legally binding, has not been generally approved, on account of the difficulty of making the laborer abide by the decision and the likelihood of discouraging the investment of capital in an industry that was conducted under this condition. A federal law of 1898 established a means of arbitration for labor disputes arising between common carriers engaged in interstate commerce and their employees. It provided for the reference of such disputes to the chairman of the Interstate Commerce Commission and the Commissioner of Labor, and if they were unable to secure a settlement, the dispute should be submitted to a board of three persons, one named by the employer, the other by the labor organization of the employees, and the third to be chosen by these two. The law also provided that the award should be final, unless set aside by the court for error. It is still too early to present the conclusions as to the workings of this law. In Great Britain the means for arbitration and conciliation were established by the act of August 7, 1896, which provides that boards constituted for the purpose of settling disputes may apply to the board of trade for registration. A board of trade may also create these boards of arbitration and conciliation whenever it seems necessary. When disputes arise the board of trade may inquire into the causes and circumstances of the differences, take steps for the settlement of the dispute by amicable means, appoint a person or persons to act as conciliator or conciliators, or appoint an arbitrator. Neither of the last steps can be taken, however, except upon the application of the parties to the dispute. The important points are that the law gives a certain official standing to voluntary boards of arbitration and conciliation and that it provides for the keeping of records, etc. Other laws contain provisions for the arbitration of disputes relating to matters with which the laws are concerned. In France there is a peculiar institution known as the councils of *prudhommes*. These are for the purpose of settling disputes between individuals, and not for the settlement of collective labor disputes or strikes. They are especial tribunals, made up of employers and workmen, to adjust by conciliation or, upon the failure of conciliation, to adjust by judicial means disputes between employers and workmen or between employers and superintendents. When their decisions involve more than a certain sum appeal may be made from them to the tribunals of commerce. They are established by the decree of the central government for particular localities and industries, and the members are chosen by the following classes of electors: employers twenty-five years of age and having certain qualifications in regard to trade experience, and resident in the district; superintendents, foremen, and workmen having similar qualifications. Membership is limited to electors thirty years of age and men who can read and write. There is the same number of members chosen in each case. The council elects its president and vice-president from among its own members, and if one of these officers represents the employers, the other must represent the employees. The term of service is six years, but members are eligible for re-election. Service is gratuitous, but the communes are empowered to pay a remuneration if they wish to do so. These councils consist of a general bureau and a special bureau, the former of two members, an employer and an employee; the latter of four members, of whom two are the president and the vice-president of the council. The special bureau has charge of minor disputes between employers and employees, and its object is to put an end to them by means of conciliation. Upon its failure to do so it turns them over to the general bureau. The functions of the councils are both judicial and administrative. Their jurisdiction is limited to the industries for which they have been established and to consideration of matters which have to do with the labor contracts or apprenticeship. The subjects which chiefly engage their attention are for the most part connected with wages, hours of labor, the maintaining of apprenticeship agreements and the penalties for defective work. Their judgments are final when the amount involved in the dispute does not exceed 200 francs (\$38.60). Disputes involving an amount in excess of that may be appealed to the tribunal of commerce. They have some criminal powers, since they may take cognizance of acts of workmen or employers which tend to cause disorder in the industries of which they have charge, but these powers are seldom exercised. The administrative functions of the councils consist in the keeping of records of the number of trades and of employees in establishments, of keeping the designs for work of which employers wish to retain the exclusive use, and of acting as an advisory body. As to collective disputes, the law of December 27, 1892,

provides for the means of settling such disputes. It was passed with a view to encouraging a recourse to arbitration. It sets forth certain methods by which employers and employees, acting either together or separately, may set in progress a movement for arbitration or conciliation. Either party to the dispute may address a declaration to the justice of the peace of the canton in which the dispute has arisen. This declaration gives the names and domiciles of the applicants, explains the matter in dispute, gives the names and domiciles of the persons to be notified of the proposal of conciliation or arbitration, and gives the names and domiciles of the delegates chosen by the applicants to represent them. The justice of the peace, who receives this declaration, must give notice of its receipt within twenty-four hours and deliver it to the other party or parties to the dispute or their representatives. If the latter agree to the proposal, the justice of the peace must invite the parties or their delegates to form a committee of conciliation, and if the agreement is rejected by this committee, it is set down in a report prepared by the justice of the peace and signed by the parties or their delegates. If no agreement is reached, the justice of the peace invites the parties to appoint an arbitrator or arbitrators. If a strike occurs without an attempt to set this machinery in motion, the justice of the peace must invite the employers and employees to make known to him within three days the nature of the dispute and their decision on the question of conciliation or arbitration. All the reports and decisions in these matters are kept at the office of the justice of the peace, who is required to send a copy free of charge to each of the parties and address a copy to the Minister of Commerce and Industry through the prefect. The request for conciliation and arbitration, the refusal or failure to respond on the part of the other party, the decision of the committee of conciliation or of the arbitrators, must be made public by each of the mayors of the communes over which the dispute extends, the justice having sent a record of these matters to them. The place of meeting for the conciliators or arbitrators is provided, heated, and lighted by the communes, and the expenses of the meetings are included in the obligatory expenditures of the communes. See LABOR.

ARBUTHNOT, General SIR CHARLES GEORGE, was born in 1824; died April 14, 1899. Having finished his studies at Rugby, he entered the royal artillery in 1843. He was a brigadier-general in the Afghan war of 1878-80; was commander-in-chief of the Bombay army in 1886 and of the Madras army from that year to 1891. In 1881 he was made a G. C. B.

ARCHÆOLOGICAL INSTITUTE OF AMERICA. The annual meeting of the council was held at Columbia University, New York, on May 13, 1899, the two preceding days being given to the annual meetings of the committees in charge of the schools at Athens and in Rome. The report of the president, Professor John Williams White, of Harvard University, shows that the council now numbers 39, while the life members were 123 and the annual members 728 at the time of the meeting, though this total of 851 has been considerably increased since last May. The plan of arranging lectures which could be delivered before the individual societies, which was begun as an experiment in 1897-98, has proved successful, and will doubtless be continued. In its early days the institute devoted considerable attention to investigations in American archæology, and now a standing committee of three has been appointed to consider how the institute may best encourage study in this subject. At present the funds are not sufficient to warrant any undertakings in this field.

The two schools which are affiliated with the institute, though not under its direct control, also report a year of prosperity. The school at Athens had fifteen students in attendance, of whom six had already spent at least one year in Greece, while all show a much higher standard of preparation than was found a few years ago. The great need of the school is a permanent endowment sufficient to provide the \$8000 which is needed annually for a proper conduct of the work. The school at Rome, after four years of trial, entered on a new stage of its history in October, 1899, when it opened with a permanent director and an annual professor from an American college. The first director, appointed for a term of five years, is Mr. Richard Norton, who has already served the school for two years as professor of archæology. This school also is making great efforts to secure a satisfactory endowment.

The twenty-first year of the institute was also marked by the first general meeting, which was held at New Haven, Conn., on December 27, 28, and 29, 1899. The meeting was so successful as to justify fully the plan of holding such a meeting for the reading of scientific papers annually. Over one hundred members registered their names, and the number of papers offered was fifty-six, though, owing to the lack of time, only thirty-nine were actually read. Professor Charles Eliot Norton, honorary president of the institute, delivered the president's address on *The Work of the American Institute of Archæology*. Special mention may also be made of the report by Professor Richardson on *The Excavations of the American School*

at Corinth, and the paper by Professor Sterrett, of Amherst College, on *Some Troglodyte Dwellings in Asia Minor*.

ARCHÆOLOGY. I. *Babylonia*.—The preparations for exploration in the valley of the Euphrates, which were announced last year, have already commenced to bear fruit, although as the work has only begun the definite statements of results are not likely to be available for some years. Two sites have been the subject of special excavations on a large scale. The Babylonian Committee of the Department of Archæology and Palæontology of the University of Pennsylvania despatched Dr. J. H. Haynes to Nippur in August, 1898, but unavoidable delays prevented his arrival at his destination until February, 1899, when a work was at once begun, which is to be continued until May, 1900. The general supervision of the work is in the hands of Professor H. V. Hilprecht, with Dr. Haynes as field director, and Messrs. Fisher and Geere as architects. A preliminary report, presented by Mr. Talcott Williams at the general meeting of the Archæological Institute of America at New Haven in December, 1899, shows that at first the explorations were confined to the southwest part of the city, where a long wall was traced and other remains of buildings found by means of trenches, in some cases sixty feet deep. Nearly five thousand, whole or fragmentary, inscribed tablets were found and many small objects, such as bowls, mirrors, etc. Four hundred and thirty-one graves were opened, and as all the details were carefully noted, a valuable addition to our knowledge of Babylonian burial customs has been made. Owing to the intense heat the excavations in the summer were removed to the temple of Bel on the east bank of the canal. In the upper levels a few objects of the late Hebrew settlement were found (about 700 A.D.), but the important finds belong to the very early history of Babylonia, from Ur-Gur (about 2800 B.C.) back to Naram-Sin and Sargon I. (3800 B.C.), while there are inscribed vase fragments and crude bricks of earlier dates, one inscription belonging to a king who ruled about 4000 B.C. The fragmentary condition of the statues and stone vases, and the numerous remnants of the contents of the temple, confirm the theory, already advanced by Hilprecht, that the temple was sacked by the great Elamite invasion which spread over Mesopotamia and even to the Mediterranean, about 2200 B.C.

The other great undertaking is the campaign which the German Oriental Society has opened at the ruins of Babylon, where Dr. Koldewey and his assistants have attacked the mound El-Kasr, which contains the palace of Nebuchadnezzar. The preliminary report shows that a trench has been begun, which is to cut directly through the mound, and has already laid bare a part of the ancient walls, which seem to have deserved their reputation for thickness. The outer wall, which is built of bricks with the stamp of Nebuchadnezzar, is 7.25 metres thick, then comes a filling of sand and rubbish, and then the inner wall of 13.10 metres, making the total 41.85 metres. The latest reports indicate that the outer walls of the palace have been reached. The objects found seem to be merely fragments of decoration in glazed bricks with reliefs, similar to those found at Susa, and a number of short inscriptions. The association has decided to spend 100,000 marks a year for at least five years on the exploration of the great capital.

II. *Palestine*.—The quarterly statements of the Palestine Exploration Fund during 1899 have brought information about important excavations at two points, conducted by Dr. F. J. Bliss and Mr. Macalister. At Tell Zakariya, a hill about three hundred and fifty feet high on the road from the plain to Hebron through the valley of Elah, a pre-Roman fortress was uncovered, occupying the southeastern corner of the plateau, with walls of rough stone about 4½ feet thick, and in some places preserved to the height of 20 feet. At the time it was built a considerable amount of débris from an earlier occupation had accumulated, and at a still later date six towers were added. It is suggested that the fort was built by Rehoboam. About half of the interior was excavated to the native rock, and the result showed that, while two main strata were distinguished, one resting on the rock, and containing pre-Jewish pottery, and the other mainly Jewish with a slight mixture of Roman near the surface, there were probably four distinct occupations of the site—that is, before the conquest of Joshua, at the time of the Jewish fortification, in later Jewish times, and for a short period under the Romans. The buildings and other remains found inside the fortress are said to have thrown much light on the daily life of the inhabitants. The place is of strategic importance and has been tentatively identified with Gath or Azekah, with perhaps a slight probability in favor of the latter.

Another possible site for Gath is Tell-es-Sâfi, where Dr. Bliss began work soon after the conclusion of the excavations at Tell Zakariya. This hill is to the west of the other, and stands at the entrance of the valley of Elah into the Philistine plain. In 1144 A.D. the crusaders built the castle of Blanche Garde on the southern end of the hill as a defence against Ascalon. Trial pits were sunk to determine the strata.

and then a section 80x90 feet was selected for complete excavation, of which about two-thirds has been cleared to the rock. The results show two pre-Jewish strata, one of which is older than that on Tell Zakariya, a Jewish stratum continuing into Greek times, and finally a deposit of the crusading occupation. As the city wall does not rest on the rock, it seems to have been built during the Jewish period. The digging brought to light part of a row of monoliths, and near by a quantity of bones of animals, while a series of chambers were grouped around. This suggests a sacred circle, around which a temple was built in the later pre-Jewish period. As yet nothing has been found to throw any light on the name of the ancient city on this hill, though Clermont-Ganneau has pointed out its occurrence on the mosaic map of Madaba under the name Saphitha.

III. *Egypt*.—That Egypt is still the field most actively cultivated by excavators appears from the list of sites in which permission to excavate was sought during the season of 1898-99. Twenty-two places or districts and eighteen excavators are named, not including the work carried on by the government. It is a cause of special gratification that no permits have been granted to dealers, and it is to be hoped that the day of unscientific digging for antiques has passed away, for almost every report of recent investigators bears testimony to the irreparable damage done to valuable sites by those whose only anxiety is to secure saleable curiosities. Of special interest also is the appearance of the Germans among the explorers, as their thoroughly organized work must add greatly to the scientific treatment of the remains of ancient Egypt. The importance attached to this new field is shown by the appointment of Dr. Borchardt as Egyptologist on the staff of the German consulate in Cairo to care for the interests of German archaeologists and museums.

The Director of Antiquities, M. Loret, has uncovered in the necropolis at Sak-kâreh a number of mastabas belonging to the VIth dynasty and richly decorated with reliefs, and in the valley of the kings, near Thebes, he has found the tomb of Thothmes I., the smallest of the royal tombs, but of special interest as the first in this great burial-place of the XVIIIth, XIXth, and XXth dynasties. In the tomb of a fan-bearer, who, contrary to the usual custom, was allowed the favor of burial in the royal valley, was found a curious symbol of a future life. An image of Osiris had been drawn on a linen cloth, which had been stretched over a couch; on this figure earth had been laid and grain sown, which by its springing up gave a figure in living green of the dead Osiris. One of the government inspectors, M. Legrain, has been occupied in strengthening and repairing the temples at Karnak, as well as in excavating in that neighborhood. That these repairs were sadly needed is clear from the report that on October 9, 1899, eleven of the columns on the north side of the great hall fell, though fortunately without carrying away any of the parts already repaired.

Explorers of the Berlin Museum have found at Abusir one of the oldest temples in Egypt, dedicated to the sun-god by a king of the VIth dynasty, and elaborately decorated with reliefs, which have unfortunately been badly mutilated in later times. The same museum has recently obtained the loan of a large mass of papyri from the temple near Illahûn, which on examination proved to be a part of the temple records, throwing much light on its management and the details of religious services. Of special importance are two letters relating to the rising of Sirius, which show that the seventh year of Usertesen III. of the XIIth dynasty fell between 1876-73 B.C., and that the dynasty ruled from 1996-93 to 1783-80 B.C., nearly one hundred and fifty years later than the latest date hitherto assigned. The value of this discovery lies in the fact that this is the first clearly ascertained date during the period of the Middle Kingdom, although the New Kingdom has long been dated with some accuracy.

For the Egypt Exploration Fund Mr. Petrie has been exploring the edge of the desert from Denderah to Hû, with results of considerable importance for the pre-historic civilization, derived from the careful classification of objects from more than one thousand graves. A further series of graves from the VIth to the XVIIIth dynasty has thrown much light on the development of Egyptian pottery. For the Græco-Roman branch of this fund, Messrs. Grenfell and Hunt have been exploring various sites at the southwestern end of the lake called Birket-el Kurin. While over one thousand papyri have been found, of which about three hundred are complete, no definite statement of the contents has yet appeared, and thus far the most important result of their work seems to be the settlement of the question as to Lake Moeris, which originally filled the Fayûm, was partially reduced by the dam of Amenemhat I., and under Ptolemy Philadelphus was forced back nearly to the limits of the present lake.

The second volume of the Oxyrynchus papyri has but little less interest than the first. In addition to a number of first-century documents and letters, similar in general character to those already published, there is a very long legal paper of the year 186 A.D., being the petition of a certain Dionysia against her father, who is

alleged to have cheated her out of some property and endeavored to take her from her husband. The document throws much light upon the property-rights of women in Egypt and the administration of the old law by the Roman magistrates; of special interest is the collection of precedents cited by Dionysia. Among the literary fragments are fifty-one lines from the end of a comedy of Menander, which give much information as to the probable structure of the play; a portion of a list of victors in the Olympian games, covering the years B.C. 480-468 and 456-448, and showing the winners in thirteen events for each year, whereby much light is thrown on the dates of some of the odes of Pindar and Bacchylides, and on the chronology of some artists of the fifth century; and an important, though fragmentary commentary on Iliad XXI., which seems to be the source of the valuable Geneva scholia to that book, though containing considerable new material, including several new quotations from classical Greek writers.

In this field two important works have recently appeared, Mr. Kenyon's *Palæography of Greek Papyri* is the first statement for the use of students of the indicia furnished by the various styles of writing as to the date and character of the documents, and of the changes in both literary and non-literary handwriting from the earliest Greek papyri down to the time when vellum superseded the earlier material. Professor Wilcken's *Griechische Ostraka* is a collection of the large number of documents of all sorts written on potsherds, a favorite material in some parts of Egypt where paper does not seem to have been plentiful. The introduction, however, goes far beyond the mere material collected, as it discusses the evidence on the economic and financial conditions prevailing under Greek and Roman rule.

IV. *Asia Minor*.—During the summer of 1898 Messrs. Anderson and Crowfoot, of the British school at Athens, made an important journey of exploration through western Galatia as far as the Halys, tracing the lines of the ancient roads, and collecting many unpublished inscriptions. They also studied about fifty ancient sites, many of which they were able to identify for the first time. A number of remains of primitive times were examined, but the question of the modifications in the civilization of the original inhabitants under the influence of the conquerors from Phrygia, Persia, and Gaul can only be settled by detailed study of the graves, though Mr. Anderson believes that the Gallic invaders were Hellenized in the cities and exerted no influence on the mass of the inhabitants in the country districts, as they were rather a small ruling class than an important element in the population. Another tour made by Messrs. Anderson and Munro through eastern Galatia and western Pontus is also said to have yielded important results, especially in the identification of sites and the fixing of stations along the Roman roads.

The work of the Berlin Museum at Priene has been brought to a close during the year. The last campaign led to the discovery on a terrace above the theatre of an important Christian church of the sixth century, a temple of Demeter and Kore, a Greek gymnasium, and other buildings. Though very successful in revealing a Hellenistic city, there is some regret that no traces were found of the old Ionic city, and it seems very likely that its site is still unknown. From Priene the excavators have turned their attention to the important site of Miletus, where the marshy nature of the soil has hitherto prevented satisfactory results. By means of deep trenches for drainage this obstacle has been largely removed, and though no detailed report has yet appeared, the discoveries thus far are said to promise well for the future. The importance of archæological work in the East has led to the assignment of Dr. Wiegand to a residence in Constantinople in order that there may be an expert available to care for the interests of the Berlin museums in Oriental discoveries.

At Ephesus the most important result of the Austrian campaign of 1898 (published in 1899) was the excavation of the theatre, including a Roman stage-building two stories high with a stage 2.70 metres high and 6 metres deep, with a richly decorated background, all apparently of the second century, while beneath were found the remains of the walls of the earlier Greek theatre. A large number of sculptures in relief and in the round, many interesting inscriptions, and two streets of great importance for the topography of the city have also been discovered.

V. *Greece*.—During the past year the Greek laws relating to antiquities have undergone considerable modification. According to the new law, all objects found are declared to belong to the state, which also has the right to dig experimentally on private property and remove articles discovered, if public interests seem to require it. No interference on the part of the proprietor is allowed, but there are provisions for compensation for damages or temporary use. If the results of an excavation are important, the state can take over the property. All discoveries must be at once reported to the authorities, and remains of buildings must not be touched for at least one month, within which time the state must decide as to the compensation. Heavy penalties are attached to violations of the law, and in particular to any private digging, which is absolutely prohibited. The law provides for the organization of a large staff of inspectors, and for their training. The museums,

which have always been free, are now to be so only on Sundays, though students will still be provided with free tickets. The provision that objects unsuitable for the Greek museums may be exported, will certainly prove advantageous, provided it is construed liberally, as it will remove the need of concealment by foreign museums of the exact source of their purchases. The establishment of the new régime in Crete has also brought with it a law regulating excavation on that island, which is now thought to contain the key to many of the puzzling problems relating to the prehistoric civilizations of the Ægean. In many respects the provisions seem similar to the new Greek law. Compensation is provided for the discoverer of movable antiquities, but they must be reported within five days. Excavation is declared the exclusive right of the government, which, however, may exercise it through scientific bodies of any nationality. It is to be regretted that all exportation is forbidden, though the authorized excavators retain for five years the right to sell casts and photographs of their discoveries.

The reports of the season of 1898-99, which have been published, as well as the current items about the work during the latter part of 1899, show that at present comparatively few great undertakings are going on in Greek lands, though the Greek Society and the foreign schools have by no means been idle. In general, however, the investigations have been at small sites, and have been directed rather to securing light on the very difficult questions concerning the so-called pre-Mycenæan and Mycenæan periods, and the origin and development of the earlier forms of Greek civilization and art, than to the exploration of great centres of classical life. Almost the only exception is the work of the American school at Corinth. The other classical sites at present under the spade are in Asia Minor.

The Greek Archæological Society has laid bare the land around the Olympeion at Athens, and thus left the temple and its columns on a sort of pedestal, but without discovering much of value. At Eleusis the report of earlier work shows that the town was important in prehistoric times, and the chief results have been yielded by the necropolis of this period. At Sunium the excavations have brought most unexpected information. The remains of the propylæa of the well-known temple were fully uncovered, and so was a long stoa extending around the north and west sides of the temple. Not far away a curious building 19 metres by 14 metres was discovered, which seems to have had columns on the south and east sides only, while the roof was supported by four interior columns. Most surprising, however, was the discovery in the temple of an inscription, which shows that this so-called temple of Athena was really the temple of Poseidon. Where the famous temple of Athena on this promontory is to be sought is still quite uncertain, though it is not impossible that it may be represented by the peculiar building just mentioned. At Thermon the excavations have shown that all the ground on which the ancient temple, now proved by an inscription to have been dedicated to Apollo, was built is formed from the ashes of a great altar. There have also been found more architectural members of painted clay, so that the conclusion seems warranted that in the seventh century B.C., at the time when Damareus of Corinth is said to have settled in Etruria, decorations similar to those found later on the Etruscan temples were already in use in Greece. On the islands of Siphnos and Syros, Chr. Tsountas has discovered cemeteries of the pre-Mycenæan age, showing a civilization similar to that on the island of Paros, but somewhat more advanced. Two citadels have also been excavated, the one on Syros apparently belonging to the latter part of the pre-Mycenæan period, while that on Siphnos was somewhat later, as the objects found were Mycenæan.

After six years of labor the French school has concluded its excavations at Delphi by uncovering a part of a gymnasium. No attempt has been made to excavate the lower town, as it is not believed the results would be sufficiently valuable. The work on Delos, too, seems to be temporarily suspended. This pause in the work of discovery is necessary, if the valuable results of past years are to be made accessible. A great mass of material from Delos is still unpublished, while of the countless inscriptions discovered at Delphi, only a small portion are available. Moreover, the school has a share in two important epigraphical undertakings proposed by the *Académie des Inscriptions et Belles-Lettres*. One is the preparation of a *Corpus Inscriptionum Graecarum Christianarum*, to include all Christian inscriptions even to the eighteenth century, with accurate fac-similes, and to be preceded by a smaller publication of all texts at present known. The other is the collection of all Greek inscriptions relating to Roman antiquities. The French have also given their attention to the study and careful reproduction of the Byzantine remains in the mediæval city of Mistra, on the slope of Mt. Taygetus to the west of Sparta.

The German institute has confined itself to smaller undertakings in Greece. Dr. Dörpfeld has continued his researches on the western slope of the Acropolis at Athens, but without reaching any satisfactory results. At Paros Dr. Rubensohn

has concluded his excavations by completely clearing the sanctuary of Asclepius, and then examining various points in the Acropolis and elsewhere. Two temples were discovered, as well as a necropolis of Hellenistic times, with sarcophagi and the usual ornaments, many of them of precious metals, while near the temples on the Acropolis a mass of pottery showed the presence of a prehistoric settlement. Dr. Hiller von Gärtringen has continued the excavations on the island of Thera, which he has conducted at his own expense since 1895. These explorations are uncovering not only many remains of the early "island civilization," but also a small city of the Hellenistic time with temples, theatre, agora, and stoa. Noteworthy also is the prompt appearance of a fully illustrated volume on Thera, describing in detail the geology, geography, botany, and history of the island, with a full account of the excavations down to 1898. The graves and their contents are to be treated in another volume.

The American school recommenced its difficult campaign at Corinth on March 27, 1899, and continued work until the end of May. The old temple was entirely uncovered and trenches were dug toward the south in the direction of the agora. Moreover, the fountain of Pirene, described in the last YEAR BOOK, was fully cleared and its identity fully established by the discovery of a Byzantine inscription which had once formed part of the façade and contained the word Pirene. The semi-circular apse found in 1898 in front of the fountain was supplemented by two others at either end, and in the court in front of the façade has been discovered the hypæthral fountain (*ὑπαῖθρος κρήνη*) of Pausanias, in a circular basin about twenty feet in diameter. Each of the apses contained three bases for statues, and the whole enclosure was lined with marble. The flight of marble steps near by, at the end of the road from Lechæum, was found to lead to the Propylæa, somewhat resembling a Roman triumphal arch, by which the agora, or market-place, was entered. The earlier trial trenches of 1896 now prove to have already determined the eastern and southern borders, and the settling of the rest of the plan is part of the work for 1900. Early in the season work was also begun upon some chambers in a huge block of native rock which had been left standing about 80 metres west of the temple when the material for that structure was quarried from the neighborhood. Its situation indicated that it was one of the monuments on the road to Sicyon, and the excavation proved that it must be the fountain Glaucæ, as there was disclosed a spring house with four chambers cut in the living rock, with a plain but effective façade of three pillars between two antæ. The water was brought from the direction of Acrocorinth by a conduit, whose exact course has not yet been discovered. Mr. Richardson suggests that the work may be probably attributed to Periander, who, like other Greek tyrants, gratified his subjects by providing a good supply of water. These excavations yielded the best sculpture yet discovered in two fine lions' heads, which had served as water-spouts. Several other pieces of sculpture and some Latin and Greek inscriptions, as well as many very early geometric vases, have been found, but the chief gain hitherto has been in fixing definitely the centre of Roman Corinth. Before the school began work not even the identity of the old temple was settled; now the temple has been shown to be Apollo's sanctuary, and besides the location is fixed of Pirene, the agora, Glaucæ, the theatre, and the baths of Eurycles. In spite of the important gains thus far, and the probability of still better results in the future, the work cannot be resumed unless funds are provided before spring, as all the available money has been expended. The difficulty and expense is great, as the remains lie very deep and the fertile soil is held by its owners at a high valuation.

The chief work of the British school has centred in the island of Melos for the last two years. The report for 1897-98, published in 1899, shows that careful excavations were made at Phylakopi, where four successive settlements were distinguished. Of the first the only traces are some very primitive potsherds. The second has left traces of house-walls, and remains showing that obsidian working was an important industry. The third period is marked by a much better city, with a strong wall and containing houses with finely decorated walls; of special interest is a vivid painting on stucco representing flying fish. The last period is contemporaneous with the Mycenaean civilization, and as at this time the use of obsidian decreased, the prosperity of the island seems to have suffered. Very little pottery of later date has been found. The last campaign (1898-99) has uncovered more dwellings of the last two periods, including a small but well-preserved Mycenaean Megaron, with an apparent separation of the men's and women's apartments. Though not of the historic interest of Mycenæ and Troy, the island is of scarcely less archaeological importance, as it has yielded a very valuable and clearly marked succession of finds, illustrating the early civilization of the Ægean. A special publication is to be devoted to these excavations, which have been discontinued for the present, as it is believed more valuable results can be secured at Crete, where work is to be begun at Cnossus and elsewhere in 1900.

VI. *Italy*.—During 1899 the chief centre of archæological discovery was the Roman Forum, but the reports show that in spite of the extensive works carried on in the capital, the Italian government did not neglect the provinces, though in general the results do not appear to have been of great importance.

In Sicily, Signor Orsi has continued his studies among the remains of the early inhabitants of Syracuse. The Sicel settlements in this neighborhood were in touch with the Mycænæan civilization, but seem to have disappeared by 1000 B.C., probably driven away by the arrival of the Greeks, who must therefore have reached Sicily earlier than the date usually assigned. The same excavator has discovered the site of the Greek town of Helorus, a dependency of Syracuse, with the remains of a wall of the fifth century, and two groups of tombs, of which the later contains objects of the fourth and third centuries.

The eneolithic period, which has been recognized in northern Italy between the neolithic and bronze periods, has been shown to extend also to the Italian islands, and in Sicily the objects from this period show marked contrasts to the neolithic styles. In spite of this, however, there seems to be close connection with the continent, and both neolithic and eneolithic remains are probably to be assigned to an Iberian-Ligurian race, whose branches developed in slightly various ways. Even the *terra-mare*, supposed to belong especially in the valley of the Po, has been discovered near Taranto between a neolithic stratum resting on the bed-rock, and an upper layer containing local pottery with geometric decorations. Moreover, megalithic monuments, such as dolmens and menhirs, hitherto unknown in Italy, have now come to light near Terra d'Otranto.

The excavations in the necropolis of Este have yielded a series of graves extending from the later bronze age down to the coming of the Gauls. The tombs of Genoa have furnished the earliest examples of the introduction of cremation in place of the Ligurian custom of burial, while the presence of painted vases and bronzes resembling those of Bologna show the extent of the intercourse with the Greek colonies of southern Italy or Gaul. By degrees the story of the early inhabitants of Italy, their migrations and development in civilization, is becoming clearer, even though the discoveries that solve some problems usually open new questions to provoke further inquiries.

At Pompeii the excavations have been continued in that part of the city near the house of the Vettii, and many small objects have been found. Somewhat earlier a temple was discovered west of the Basilica, which was evidently in process of removal at the time of the eruption. A noteworthy addition to our knowledge of Pompeii is the work by Professor Mau, translated by Professor Kelsey, which at last provides English readers with a thoroughly accurate and modern discussion of the city and its remains by an acknowledged authority.

If the results in other parts of Italy have been such as to develop facts already known, in Rome the discoveries have been almost sensational, and have changed the work in the Forum from tentative exploration with about twenty men to a serious undertaking which already employs over one hundred. Near the close of 1898 the finding of the "black stone" was reported, and it was in this neighborhood, east of the Arch of Severus, that the most striking discovery was made. The black stone pavement, although it is certainly of very late date, has been regarded as too important to be removed, and so the work around it was somewhat delayed until a supporting framework was arranged, permitting excavation beneath. It was then found that some two metres below the *niger lapis* was a layer of yellow tufa, and on this a dark tufa base on which are two pedestals, whose shape suggests that they supported the two lions which an old legend mentions as guarding the tomb of Romulus. These bases were connected on the south by a step of tufa, and between them on the north, toward the Curia, was a smaller base. Slightly to the west of these bases and on the same level were a plinth on which stood a truncated cone, and near by the lower part of a quadrangular pyramid, one angle of which had been rudely bevelled. This monument is of special interest as containing by far the oldest inscription discovered in Rome, and probably the earliest specimen of the Latin language. It is written *boustrophedon*—that is, the lines run alternately from left to right and right to left. Owing to the breaking of the stone, only the beginnings and endings of the alternate lines are preserved. As it is altogether uncertain how much of the stone is missing—it may be that only about one-third is preserved—there seems very little hope of any satisfactory restoration or interpretation. Only a few words can be recognized, and all that seems even reasonably certain is that it has something to do with sacrifices. As to the question of date, opinion is somewhat widely divided. Some of the Italian scholars, who are anxious to find in the stone a proof of the veracity of early Roman legend, have endeavored to show that it is at least as early as the first half of the seventh century B.C. More conservative critics are disposed to place it at the very end of the sixth or early in the fifth century, but on palæographical grounds the evidence is really very uncertain. Among the

débris was found a fragment of a black-figured Greek vase of the last part of the seventh or early sixth century. It is said that the whole structure is evidently built on the Roman-Attic foot of 0.295 metres, and if this is true it is probably not much earlier than 450 B.C., but the inscription may well be older than the bases for the lions. However this may be, there can be no doubt that both cone and inscribed cippus were rudely broken, and that later, probably in connection with a raising of the level at that part of the Forum or Comitium, a solemn expiatory sacrifice took place; for above these stones was found a layer of dark earth containing fragments of tufa, charred bones of victims, hundreds of small vases, figures in bronze and bone, rings, pins, fragments of weapons, and a number of pieces of *as rude*, the earliest Roman money. The exact meaning of all these objects is still unsettled, for their relation to the topography of the republican Forum is far from clear. The problems, however, are by no means insoluble, and the news has recently arrived that all the difficulties caused by the presence of the modern street on the north side of the Forum have been removed, and that the place in front of the Church of San Adriano, known to occupy the site of the ancient Curia, or Senate-house, is to be thoroughly cleared. As the present pavement of the Comitium is now known to be late, it will, of course, be necessary to go beneath it.

Hitherto the private houses extending from the Church of San Adriano to that of San Lorenzo in Miranda (the temple of Antoninus and Faustina) have prevented the excavation of the site of the Basilica Æmilia. This obstacle has now been removed by the generosity of Mr. Lionel Phillips, a wealthy Englishman, who, having bought the land, has presented it to the government for excavation. The work has begun in the summer, but as yet very little of the architecture of the early building has been found, though a mass of walls belonging to the Middle Ages seems likely to throw light on the process of the destruction of the city. The marble steps of the Basilica have been uncovered, and also the foundations of a row of pillars. It is said that the length was about 60 metres, and the depth 20 metres. As the excavations are still far from completion, it is obvious that the plan of the building and of its later modifications cannot yet be prepared.

In other parts of the Forum the indefatigable Signor Boni has not been idle. The alley between the Regia and Atrium Vestæ has been cleared, and among other things a well has been discovered filled with a mass of pottery, chiefly broken, but showing a regular succession of deposits from the time of the early bucchero ware. Further excavations in the Atrium Vestæ have shown that about the fourth century A.D. the floors of the cells were raised, probably on account of dampness, and that the handsome marble mosaic floors are still preserved beneath these clumsy alterations. In one place the statue of a Vestal was found carefully buried, but without the head. The suggestion has been made that it belongs with a pedestal from which the name of the priestess had been erased.

The course of the Sacred Way has also been followed, and it has been found that in earlier times it occupied a much lower level, and took a very different course toward the Arch of Titus from the Basilica of Constantine than is indicated by the present pavement. In other places, too, small discoveries are constantly made, and it seems certain that in a short time the picture of the Forum and its surroundings is to become much more definite, especially in the distinction between the buildings of different epochs.

VII. *France*, including *French Africa*.—For more than thirty years excavations have been continued at Bibracte, the town of the Hædui, and a recent report discusses the 1579 coins found there. Two-thirds are Gallic, representing over twenty tribes, but of special interest are four with the name of Orgetorix, and seven with that of Dumnorix, both well known from Cæsar.

In Tunis, Father Delattre has continued his work in the Punic cemetery of Carthage at Bordj-Djédid. The tombs are pits with grave chambers opening from them, usually containing several bodies. In the earlier graves skeletons are found, but later cremation was customary, and we find ash chests containing charred bones. Many small objects have been found, among them an ivory relief of a boar with an inscription in Etruscan. It is interesting to recall that in the fifth century the Etruscans and Carthaginians combined against the Greek colonies on Corsica. The temple of Demeter seems to have stood near this cemetery, and Father Delattre is inclined to connect the introduction of cremation with this worship, which was brought from Syracuse by Greek priests after 396 B.C. P. Gauckler has also excavated a Punic necropolis in this neighborhood where the objects in the graves seem to show a civilization strongly affected by the East and Egypt, and hence anterior to the Punic wars, when Greek and Latin influence prevails. He also discovered under a house of the time of Constantine a sanctuary of Jupiter Ammon. Four statues, three of good workmanship, were found hidden carefully, and the conclusion is drawn that on the final triumph of Christianity the images of the gods had been secreted.

In the other European countries archæological investigations are, of course, always in progress, but the past year has not been marked by any striking discoveries. In Germany and Austria the remains of the Roman occupation are being excavated and described, and in England not only at Silchester, but also at Caerwent, Roman towns are being systematically cleared. In Spain attention seems directed to the remains of pre-Roman civilization, and the work of classifying the early Spanish graves has been begun.

ARCHÆOLOGY (AMERICAN). While classical archæology derives a special and lively interest from the fact that it deals with vestiges of our own ancestry, the archæology of the new world acquires commensurate interest from the fact that it clears the way to understanding the earliest stages in the development of mankind; hence, the American researches greatly extend the vista opened by those studies of old world archæology which have been pursued so actively and successfully during past decades. Dealing as he does with the æsthetic and industrial types whence his own standards sprang, the archæologist of the old world finds it easy to interpret the artifacts of ancestral nations and tribes in terms of current manual and mental activities; he has but to turn backward the leaves of parental histories in order to trace the records of earlier generations left in their imperishable handiwork. The occidental investigator, on the other hand, finds his archæologic record to form an older book of a distinct series, inscribed in characters not to be interpreted from his personal or ancestral experience, but only to be read in terms of native mentality; so that his first duty is to acquaint himself with the methods and characteristics of the aboriginal handicraftsman. This distinction between the archæology of the old world and that of the Western Hemisphere is fundamental and far-reaching in its consequences; it defines the relations between the European and the American sciences, and it gives rise to the originality and independence of the American standards and methods of research in archæology.

Definitions.—Recent researches have tended to confirm the assignment of archæology to a secondary place among the sciences dealing with mankind and their less perishable products. Early in 1899 the Anthropological Society of Washington (the most active organization of its class in America) revised its organic law so as to represent fairly the various branches of anthropologic science; thereby it was organized into seven sections—namely, A, Somatology, or the science of the (human) body; B, Psychology, or the science of the mind; C, Æsthetology, or the science of arts; D, Technology, or the science of industries; E, Sociology, or the science of institutions; F, Philology, or the science of languages; G, Sophiology, or the science of philosophies. In this scheme material objects-matter in the form of artifacts pertain partly to æsthetology but for the most part to technology, while artifacts of prehistoric origin form the objects-matter of archæology. In connection with this classification, the same society favorably considered the proposal to introduce a new term for the designation of the American aborigines collectively—namely, *Amerind*; the term (which has already come into use among American anthropologists) being semi-arbitrary in construction, and chosen partly because of the facility with which it can be used in various forms—for example, *Amerindian*, *Amerindic*, *Amerindise*, etc. During the last decade, observations of aboriginal handicraft gradually led to the conclusion that decorative and other æsthetic devices originated in symbolism; and during the past year the parallel inference that primitive industrial devices are largely symbolic in origin has been formulated, and has found ready acceptance. The inference rests on the well-observed fact that the Amerinds are dominated by zootheistic (or animistic) motives, and habitually deify certain animals of their acquaintance, particularly the stronger and swifter and more cunning; and that they habitually seek to obtain and to infuse into their own personalities and appendages, by ceremonial and actual use of the animal organs, the strength and swiftness and cunning of the deified beasts. Thus, the teeth of the shark, the claws of the bear, the shells of certain mollusks, and the beaks of eagles are used as weapons; the incisors of the beaver are used as cutting tools, while tufts of feathers and fillets of deerskin are worn to promote swiftness, and fox-tails or coyote scalps to promote cunning; and even the most highly developed emblems and weapons, such as tomahawks and knives, commonly bear vestiges of this symbolic origin in special forms and markings. The recognition of the symbolic origin of industrial devices would seem to mark an epoch in archæology. The discovery tends to magnify the importance of the more perishable artifacts of tooth, shell, horn, bone, and wood, and correspondingly to minify the value of stone artifacts as a basis for the classification of primitive industries, despite their great abundance, due to their imperishable material. In accordance with the discovery, Cushing has proposed to designate the earliest stages of human culture as "pre-lithic," so that the culture-stages, defined through researches among the American aborigines, become (1) Prelithic, or characterized by implements of organic material and symbolic design; (2) Protolithic, or characterized by designless or use-shaped

stone implements, and (3) Technolithic, or characterized by stone implements, wrought in accordance with preconceived design. This classification of stages in industrial development is strictly genetic; it can be applied chronologically only with considerable qualification, since the earlier devices persist largely in the higher stages, and also since the advancement attained by different contemporaneous tribes was widely diverse.

Instrumentalities.—The leading institution engaged in archæological researches in America during 1899 was the Smithsonian, through its branches, the Bureau of American Ethnology and the United States National Museum; the archæologic operations of the bureau were prosecuted specially in Arizona, California, Colorado, Maine, and New Mexico, while the museum made researches and collections in various parts of the United States, as well as in Mexico and several South American countries. Important researches and collections were made also by the American Museum of Natural History (New York), largely in connection with the Jesup North Pacific expeditions, but to some extent in several other districts. Particularly rich collections were installed in the new Museum of Archæology and Paleontology of the University of Pennsylvania (Philadelphia), in which also important researches were conducted. Extensive operations were conducted in southwestern United States, Mexico, and Central America by the Peabody Museum of Archæology and Ethnology (Harvard University, Cambridge); while the Field Columbian Museum (Chicago) contributed to knowledge through work in several districts of western United States. Noteworthy work was prosecuted also by Carnegie Museum (Pittsburg), Golden Gate Park Museum (San Francisco), the Ohio State Archæological and Historical Society (Columbus), the State Historical and Natural History Society of Colorado (Denver), the Arizona Antiquarian Association (Phoenix), the New York State Museum of Natural History (Albany), the Ontario Archæological Museum (Toronto), and several other working organizations. The results of the researches were brought out and co-ordinated in the Anthropological Section of the American Association for the Advancement of Science, the Anthropological Society of Washington, and the Anthropological Society of New York; the principal media for publishing being the *American Anthropologist* and the *Proceedings of the American Association for the Advancement of Science*.

Prelithic Artifacts.—One of the most noteworthy collections of American antiquities was that made in 1895 and 1896 by Frank Hamilton Cushing on the western coast of Florida; it was obtained chiefly from salt marshes and muck beds, in which easily perishable artifacts were preserved in remarkable perfection; and it is unprecedentedly rich in industrial and ceremonial devices of shell, tooth, horn, and wood, while many of the artifacts of wood and shell are beautifully carved and painted. During 1899 the extensive collection was overhauled, divided between the United States National Museum and Pennsylvania University, and subjected to a critical study. The results of the study (incorporated in the report of the secretary of the Smithsonian Institution for 1899) are indicated in a preceding paragraph. Concordant results have attended the final study of the collections among the Seri Indians by W J McGee. This interesting tribe has been found nearly destitute of knives and practically devoid of knife-sense, and the comparison of their meagre artifacts with the more abundant implements and ceremonial objects of the Florida muck beds indicates a close correspondence in culture, although the Seri tribe, whose habitat abounds in wave-worn pebbles, exhibit definite entrance into the stage of protolithic art.

Protolithic Artifacts.—Early in 1899 certain collections made in California by W. H. Holmes were installed and subjected to study in the United States National Museum, and many of the stone artifacts were found to represent the initial stage in the development of stone-working. Several of the California tribes may be classed as acorn people, since acorns form their principal source of food, and since their characteristic industries are conditioned by these food supplies. Some of the processes and implements vary from tribe to tribe—for example, in some places the acorns are cracked in the teeth, in others they are cracked with spheroidal stones, and in still other places elongated, pestle-like stones are employed; while other devices, such as those used in grinding the acorn meats, are much alike from tribe to tribe, though in each tribe there may be a diversity, growing out of the age of the apparatus or the degree of its development by use. Thus, the nether millstone is, in the early stages of use, a flat or slightly concave slab, which after more extended use becomes a deeply concave metate, still later a shallow mortar, and at length a deep mortar, which may eventually be worn through; while the grinding-stone concordantly changes from a simple cobblestone to a mano or muller, and finally to a pestle, at first thick and rude, but afterward slender and shapely. Not infrequently the genesis of an individual mill corresponds with the rise and passing of a family; the young woman may begin life with a flat-sided bowlder and a few river-worn cobbles as a mill, which is then used as a metate;

gradually the mill develops into a mortar, with a well-rounded and polished pestle, shaped chiefly by wear (perhaps supplemented by slight dressing), on which she grinds vigorously in her old age for the support of her daughters and their husbands and the growing grandchildren; and on her death apparently the pestle is broken and the bottom knocked out of the mortar. Neglecting the final act, the individual growth of the primitive mill well epitomizes the phylogeny of its species, and demonstrates that in general the mortar must be regarded as the differentiated and eventually degraded offspring of a metate-like prototype, whence sprang also the metate along one line and the quern and its derivatives along another. It is especially significant that the users of these mills take little note of the progressive change in their apparatus with continued use, and regard the pieces as natural objects rather than artificial objects—indeed, the most finely formed pestles are habitually called, and actually considered to be, river pebbles or cobbles. These observations on the living California Indians explain the moderately abundant prehistoric artifacts in the same region, of which considerable collections have been made; at the same time they aid in interpreting collections of prehistoric artifacts from other districts.

Technolithic Artifacts.—The customary attention has been given to flaked and sculptured stone artifacts by numerous investigators and collectors. The most extensive studies were those of W. H. Holmes, in connection with the remarkable obsidian mines in the state of Hidalgo, Mexico. Of the many sources of obsidian (or volcanic glass) for the manufacture of implements and ornaments by the prehistoric Mexicans, this was probably the most important. The Amerinds first encountered by Cortez in Mexico employed numbers of obsidian knives, the larger number being mere flakes, yet so large, symmetric, and keen-edged that they were used for hair-cutting and shaving, as well as for incising flesh for all purposes, including surgery and human sacrifice; and exploration of the site throws full light on the processes of quarrying and manufacturing this aboriginal cutlery. The mines or quarries cover at least a square mile of a mountain ridge, which is still pitted with shafts ten to thirty feet deep, connecting with horizontal drifts, made in search of homogeneous masses or nodules; and almost the entire surface is sheeted with flakage, often several feet deep. Examination of this wastage in the light of known processes shows that the local labor consisted mainly in working out homogeneous masses and shaping these into the form of thick cylinders, usually four to six inches in length; and the observations on the ground and in other districts indicate that these cylinders were articles of extensive commerce, and were among the most highly prized possessions of tribesmen and families, the blades being obtained by skilful flaking from the cylinders, which were eventually reduced to the well-known "cores," not by the quarrymen, but by the makers of the knives as they were needed from time to time. Incomplete and defective cylinders were found by thousands, mingled with the other wastage; and numerous examples were found also of the stone hammers and picks used in the excavation and in roughing out the cylinders. The extent of the workings indicates that the Hidalgo quarries must have been operated for many centuries. Another noteworthy investigation of the year was that of an ancient chert quarry in Union County, Ill., by Dr. W. A. Phillips. The results indicate that, although the quarry was less extensive than some of those previously found in Ohio, Indian Territory, and Arizona, the site yielded vast numbers of the large and well-flaked flints scattered so profusely over the middle Mississippi Valley, and associated intimately with the ancient mounds. Important collections of technolithic artifacts were made also in Ohio by W. C. Mills, in Georgia by Robert Steiner, and in various parts of Canada by David Boyle and several collaborators, as well as in central California by W. H. Barr and Edward Hughes; the collections by the last-named investigator included several examples of beautifully chipped obsidian blades of curved form, supposed to have been used as surgical instruments. This supposition grows out of the researches of McGee in primitive trephining; and it is noteworthy that the mode of operation, inferred from the Peruvian crania, in connection with the known methods and motives of the aborigines, has been virtually established by Dr. Philip Mills Jones, of San Francisco, through experiments on (anesthetized) dogs, conducted in the precise manner suggested by the archæologic studies. The instruments used were wholly of stone, the buttons removed were not replaced by plates, the integument was restored without stitching, and the animals treated recovered promptly and completely. Noteworthy publications on stone art have been made by Warren K. Moorehead, Thomas Wilson, J. D. McGuire, and others; the last-named author, in a memoir on pipes and smoking customs, pertinently suggests that several types of pipe hitherto deemed wholly prehistoric bear traces of Caucasian influence. The work of Harlan I. Smith, of the Jesup expeditions in British Columbia, also has thrown new light on the technology of certain Amerind tribes, particularly skilful in carving and other work with stone tools.

Fictile Artifacts.—During 1899 Dr. J. Walter Fewkes continued the arrangement and study of his unequalled pottery collections from the Pueblo country, and his researches have added materially to knowledge of the prehistoric technique and of the symbolism of the painted ware. He demonstrates that the ancient potters were organized into clans or gentes analogous to those of their modern descendants; that these kinship groups were distinguished by totems or crests, which at the same time represented zoic deities; that the finer ware was designed primarily for ceremonial use in connection with religious observances; and that the best examples were designed for sacramental purposes alone, and were eventually buried with the bodies of their owners, either intact or broken. Another noteworthy study of fictile work, by W. M. Beauchamp, was based on collections from central New York, including plain and decorated pots, pipes, totemic effigies, etc.; the work is specially significant as indicating that the motives so prominent in the minds of the Pueblo peoples were shared in little diminished intensity by the less sedentary tribes of the humid woodlands toward the Atlantic. In connection with the more highly differentiated fictile ware, the observations of Clarence B. Moore in southeastern United States are of interest; in excavating certain aboriginal mounds he found remains of walls made of wrought clay, evidently hardened into brick-like masses by the addition of a tempering or cementing substance, and by some drying or burning process. Of similar import are traces of ruined structures found in certain shell mounds of eastern Virginia in the form of small earthen bricks, samples of which have been placed in the National Museum by Dr. Anita Newcomb McGee; both the bricks and the clay walls suggesting structural devices on the Atlantic coast related to those so extensively developed in the arid regions of both Mexico and western United States.

General Artifacts.—Early in 1899 W. H. Holmes visited the remarkable ruin of Xochicalco ("The Hill of Flowers"), near Cuernavaca, Mexico, and made important observations on the ancient structure. The ruin occupies a hill, rising several hundred feet above the river washing its base, which has been literally remodelled from base to summit; wall upon wall of solid masonry face terraces encircling the entire hill, and the crest is crowned with remains of extensive temples and courts. One of the temples is fairly preserved; it is a single-story, flat-roof structure, about sixty by seventy feet, surrounded by a heavy cornice, rising from a pyramid sixteen feet in height, whose sloping sides are entirely covered by symbolic serpents carved in high relief, the ascent being by a wide stairway of carved stone. The tools with which the stone-cutters wrought were found in numbers; they are stone hammers, celts, etc., identical in character with those found on sites of stone-working throughout North America. Associated with these were fragments of pottery, both painted and plain; and traces in the ruins, as well as better preserved vestiges in adjacent caverns (artificial in part), indicate that both walls and floors were plastered. Studies of ancient structures were made also in the Pueblo country by George A. Dorsey, F. W. Putnam, F. W. Hodge, J. Walter Fewkes, and others; the general effect of these studies is to establish the unity of Amerindian architectural motives, save as diversified by local conditions. Noteworthy studies of the ruined structures of Honduras by M. H. Saville and others, under the direction of Professor Putnam, and certain of the surveys directed by Dr. Franz Boas, were of related import. Meantime, Cornelia Horsford continued investigations of the peculiar house remains of eastern Massachusetts, and, with the aid of expert collaborators from Denmark and Iceland, demonstrated that they are similar to the Norse ruins of Scandinavia and Iceland, and dissimilar from the known house types of the American aborigines. Researches in the aboriginal mounds have also been continued by various individuals and institutions; and there has been much interest in the aboriginal codices and other inscriptions, due largely to the continued munificence of Duc de Loubat in reproducing the more noteworthy codices, in fac-simile, for the benefit of libraries and students.

Evidences of Human Antiquity.—During the year Professor Holmes published the results of his researches and those of McGee and others in the Table Mountain region of California, while W. P. Blake published the record of his personal observations in connection with the Calaveras skull. The indications are now clear that the reporters of human relics in the auriferous gravels erred as to age of the deposits, which are for the most part middle or early Tertiary rather than Quaternary, as was at first supposed; also that the association of the relics with the auriferous deposits was frequently, if not always, adventitious, the commingling of surface materials and deep-lying gravels being due largely to conditions attending hydraulic mining; and hence that California yields no indubitable evidence of high human antiquity. Toward the close of the year Professor Putnam reported a human bone from deposits supposed to be late Quaternary in age at Trenton; this discovery is still under consideration. On the whole, the question of human antiquity in America remains open; there is a natural presumption that the hemisphere

has been inhabited by man since some time in the Quaternary or Pleistocene period; but the direct evidence of high antiquity seems inconclusive, and of decreasing weight with the increasing refinement of observation.

ARCHITECTS, AMERICAN INSTITUTE OF, founded in 1857, had in 1899 a membership of 400 fellows, 60 associates, 54 honorary and 66 corresponding members. General meeting for 1900 to be in Washington, D. C., in December. The Institute publishes annual *Proceedings* and a quarterly *Bulletin*. President, Robert S. Peabody; secretary, Glenn Brown, Washington, D. C.

ARCHITECTURE in the United States and England. The present article aims to give a brief sketch of the notable features in the progress of architecture in the United States and England, especially some of the signs of recent architectural progress, the awarding of prizes in important competitions, and the meetings of leading architectural societies.

Recent Progress in the United States.—A hopeful sign of improvement in the architecture of government buildings was the opening of the design of such buildings to competition under proper restrictions, instead of having the construction take place in all cases according to the design of the supervising architect of the Treasury Department—a practice that often resulted in stiff, machine-like designs. The higher grade of architectural work now being done in America and the good prospects for the future have been attributed largely to the training and influence of the architectural schools. Such schools have been established in a number of the universities and other institutions in the United States. Besides the advantages afforded therein to many students, travelling fellowships have brought some into close touch with the best foreign art; and, in addition, many of the younger architects have studied at the École des Beaux Arts, Paris. Another sign of progress is the growing spirit of co-operation between architects and engineers. Several papers on this topic were read during the year before architectural and engineering societies. The plea was made that engineers should pay more attention to æsthetics, calling in architects when necessary, and that architects should give more care to safe construction, good plumbing, heating and ventilation, turning over these problems to outside engineers or associating engineers with them in their work.

Competitions, etc.—One of the most notable events in the history of American architecture was the Phœbe Hearst prize competition for a magnificent group of buildings for the University of California, at Berkeley, Cal. After a world-wide competition a most capable jury awarded the first prize (\$10,000) to a Frenchman, M. Henri Jean Émile Bénard. All the other prizes went to America, as follows: (2) Howell, Stokes and Hombostel, New York, \$4000; (3) Despardelles and Stephen Codman, Boston, \$3000; (4) Lord, Hewlett and Hull, New York, \$1000. Competitions in the United States have often been conducted in a manner which gave no assurance of a just award and which granted no compensation to unsuccessful bidders. The Phœbe Hearst competition was a notable exception.

Meetings of Societies, etc.—The thirty-third annual convention of the American Institute of Architects was held in Pittsburg from November 13 to November 16, 1899. Mr. Henry Van Brunt, of Kansas City, Mo., and Mr. Glenn Brown, of Washington, D. C., filled the offices of president and secretary of the association. Mr. Van Brunt estimated that there are 5000 architects in the country, of which one-tenth are members of the institute. He referred to the fact that "there are now seven United States government buildings in different sections of the country being designed or built under the direction of private architects, instead of under the supervising architect of the Treasury Department, as formerly. He regretted that there are still so many competitions conducted without proper safeguards to the competitors, and that so many architects still enter such competitions." Among recent examples of properly conducted competitions, he mentioned that for the group of buildings for the University of California, under the Phœbe Hearst prize offer. Mr. R. S. Peabody, of Boston, was elected president. During the year permanent headquarters for the institute were established in The Octagon, Washington, D. C. The rules governing competitions have been modified, so as to make the compensation to competitors range from \$100 to \$1500, according to the importance of the work. Reports from the twenty chapters scattered over the country show that most of these chapters held successful meetings during the year. At the convention important papers were read on *Electricity in Modern Buildings*; *The Manufacture of Steel for Building Construction*; and *The Legitimate Design of the Architectural Casing for Skeleton Steel Structures*. Mr. C. H. Blackall, of Boston, favored the Italian Renaissance as the style most appropriate for the decorative treatment of a high building.

The Municipal Art Society, of New York, offered three prizes of \$300, \$200, and \$100 for designs for a public street transfer station, to be placed at the Central Park terminus of the Broadway line of the Metropolitan Traction Company. The

meeting of the Builders' Exchange, of Cleveland, was notable, and discussed the arrangement of new public buildings—a city-hall, a court-house, a public library, a post-office, and a government building. The Society of the Beaux-Arts offered prizes for competitions for a band-stand at a large seaside resort; a reviewing-stand on a large city square; an open pavilion in a large city park; and a boat-house and landing stage for a yacht club. The Boston Architectural Club met on October 2, 1899, and elected Edward H. Hoyt president. The Baltimore Architectural Club held its meeting on October 5, electing William W. Emmert president. During the season of 1898-99 the New York Chapter, American Institute of Architects, devoted a number of meetings to the presentation of plans for beautifying the streets, waterfronts and public buildings of New York. The jury for the architectural exhibit at the Paris Exposition, which convened at the American Fine Arts Building, New York, on November 4, 1899, consists of John M. Carrere, William R. Mead, Frank Miles Day, R. S. Peabody, and Cass Gilbert. The appointments on government architectural work made in October were the Custom-House in New York, to Mr. Cass Gilbert, of New York, and the Department of Justice Building, in Washington, D. C., to George B. Post, of New York.

England.—Architecture in England during 1899 was satisfactory, if not exceptionally brilliant with regard to the art of architecture or the business of architects. The most important event of the year was probably the production of the designs for the new government offices, by Mr. T. M. Brydon and Mr. W. Young, which an English critic said "will certainly add to the impressiveness of the official thoroughfare of the metropolis, without overwhelming or even conflicting with the notable buildings already existing in Whitehall and Parliament Street." During the year South Kensington has seen progress made toward the completion of the Victoria and Albert Museum and the Royal College of Science, both designed by Mr. Aston Webb. Manchester saw the opening of a "beautiful building, the Rylands Library, designed by Mr. Basil Champneys, enriched with sculpture and modelling by Mr. George Frampton, Mr. Cassidy and Mr. Bridgeman, and with stained glass by Mr. Kempe." The exhibition of the Royal Academy in its bearing on architecture indicated that the architects were chiefly interested in constructing domestic buildings. Only one government building was represented—Aston Webb's design for the Britannia Royal Naval College at Dartmouth. The style of design of the works shown at the Royal Academy and also by students' exhibitions in various educational centres showed very clearly that while the work of the eighteenth century furnished inspiration for the *fin-de-siècle* designs, there was a tendency, particularly among the younger men, to break away from conventional lines and aim at originality. Their taste tends toward a revival of the best Gothic style. Ecclesiastical building was on the wane. As an example of the poverty or callousness of the church in the past year in respect to the art of architecture, the scheme for the spoliation of the forecourt of the church of St. Dunstan in the West may be cited. Although, apparently, the Church cannot or will not find money for the erection of places of worship, it is remarkable that during the past year a tender of £18,967 was accepted for the erection of the archiepiscopal palace at Canterbury, and the commencement of the erection of a diocesan church-house at Liverpool. This condition led a critic to ask: "Are we face to face with a recrudescence of the spirit of the clergy of France during the early Renaissance period, which led them to build châteaux rather than churches?" A new cathedral has begun in Belfast. Mr. Thomas Drew, R.H.A., its architect, assisted by the advice of Mr. W. H. Lynn, R.H.A., has produced a remarkable plan, departing in motif from the mediæval cathedral type and adapted to the modern conception and use of a cathedral. The Building Trades Exhibition, at Agricultural Hall, London, was directed to the display of the practical and business side of architecture. The collection of specialties in building construction and material brought together was superior to anything of the kind ever seen in London, and reflected credit on its organizer, Mr. Greville Montgomery. The Furnishing Trades also held an exhibition at Agricultural Hall, and gave evidence of the triumph of the mercantile instinct over taste and beauty. The Sanitary Congress, held at Southampton, was important.

The architects shared in the general prosperity of the country during the first months of 1899, but the war checked building enterprises. Immense sums were expended upon asylums, workhouses, and hospitals, but the tremendous activity in the rebuilding of public houses and provincial theatres and music-halls collapsed. Striking examples of rebuilding in London include: The buildings of the Birbeck Bank, the Carlton Hotel, and the terminus of the Great Central Railway. The architectural societies flourished. The Royal Institute of British Architects numbers 1663 subscribing members. The Architectural Association at its opening meeting had a record membership of 1250. The British Fire-prevention Committee, connected with architecture, incorporated a valuable series of scientific tests of fire-resisting materials and construction. Iron, steel, hardware, and other building

materials were subjects that occasioned great interest and discussion. The principal competitions were: For fire-brigade station at Bradford, won by Messrs. Mawson and Hudson; for the Cartwright Hall, at Bradford, won by Messrs. Simpson and Milner Allen; for baths at St. Pancras, won by Mr. T. W. Aldwinckle; for municipal buildings at Plumstead, won by Mr. A. B. Thomas; for the offices of the Midlothian County Council, in which the assessor's award of first place to Messrs. J. N. Scott and A. Lorne Campbell was set aside by the County Council in favor of the design by Mr. J. Macintyre Henry. The most important competition of the year, that for the new Sessions House, Old Bailey, limited to six architects nominated by the Council of the Royal Institute of British Architects, still remains undecided, although the drawings have been sent in. Appointments of importance were: Mr. W. E. Riley, as superintending architect of the London County Council; Mr. C. E. Dance, as surveyor to the Metropolitan Asylums Board; and Mr. R. Elsey Smith, as professor of architecture at King's College.

ARCTIC EXPLORATION in 1899 was marked by much persistent and heroic effort, but few important new discoveries were made, and the "farthest north" point, $86^{\circ} 14'$, established by Professor Fridtjof Nansen on April 7, 1895, was not attained. The Americans, Lieutenant Peary and Mr. Wellman, reached the most northerly points, both being near the 82d parallel. The expeditions represented, besides the United States, Sweden, Italy, Denmark, Russia, and Monaco.

The experience of explorers has established as the best means of reaching the ultimate north the "dash-for-the-Pole" method. The old theory of a gradual approach from depot to depot lasting for many months has been abandoned. The reason is that there is no land extending near the Pole, and protracted sledge journeys cannot be made over the frozen sea. The two lands reaching nearest to the Pole are North Greenland and the islands of Franz-Josef Land, but so far as is known neither reaches nearer than about 450 miles. The problem, then, is to establish a base of supplies on the land as far north as possible—an undertaking that may occupy a year or two—and then traverse over the floe the remaining 450 or 500 miles as quickly as possible. There are two reasons for the necessity of this final "dash." First, it is almost impossible to travel over the frozen sea in the summer, not only on account of the melting condition of the surface, but on account of the dangers of the ice splitting and even breaking up; moreover, little sledge progress over the floe has hitherto been made during the winter—that is, the period of the polar night; hence, from the latter part of February to perhaps the middle of June—at most 125 days—is the only favorable time for proceeding beyond land. Secondly, as all equipment, provisions, and fuel must be carried not only for the advance but for the return, since it is useless to establish depots on the ever-shifting sea-ice, a rapid journey is necessitated by the limited carrying ability of the men and dogs. The subjects of special interest in Arctic exploration in 1899 are treated in the following paragraphs.

Andrée.—On July 11, 1897, S. A. Andrée with two companions left Dane's Island, about 80° N., in a balloon, with the hope of drifting across the Pole. Frequent rumors concerning him have appeared, but no definite and trustworthy information has been received after his pigeon-post dated July 13, 1897. Unconfirmed reports of a balloon having been seen and bodies found have come from both northern Asia and northern America. Several expeditions have made unavailing search along the coasts of Greenland and Siberia, but the only trace hitherto found of the Andrée balloon is a buoy picked up about September 11, 1899, at a point to the northeast of Spitzbergen, about 80° N. and 25° E. The buoy, which had been taken by Andrée for the purpose of dropping it with a letter in case he crossed the Pole, was identified at Stockholm on October 1. It contained no letter, and besides an anchor was attached. It is conjectured accordingly either that the buoy and anchor were thrown out to lighten the load and thus keep the balloon longer afloat, or that the latter has been lost in the sea while buoy and anchor floated away. Mr. Walter Wellman believes that Andrée and his two comrades "lost their lives by a descent of their air-ship into the waters of the Berents Sea, east of Spitzbergen and south of Franz-Josef Land, probably within ten or fifteen days after their ascension."

The Peary Expedition.—The *Windward*, returning from the North, reached Newfoundland in September, 1899, and reported that Lieutenant Robert C. Peary, who, in July, 1898, sailed for northern Greenland, whence he expected to make a dash across the ice for the Pole, had not succeeded in advancing beyond his previous farthest-north point. From August 18, 1898, to August 2, 1899, the *Windward* was frozen in at Allman Bay, Grinnell Land, $79^{\circ} 40'$ N., on the west side of Kane basin, and about fifty miles north of Cape Sabine. During this time Lieutenant Peary conducted a number of sledging journeys, that aggregated more than fifteen hundred miles, by which he added much to the geographical knowledge of that part of the polar regions. He explored and mapped large parts of Ellesmere Land and Grinnell Land, charting the coast-line north and west of Cape Sabine to

a point beyond Greely Fiord (about 80° N.), and definitely outlining the hitherto confused coast on the western side of Smith Sound, between Cape Sabine and Cape D'Urville. His discovery that Hayes Sound, northwest of Cape Sabine, supposed to be a continuous channel through to the Arctic Ocean, west of Ellesmere Land, is only an inlet, proves that the latter and Grinnell Land are parts of the same island. Lieutenant Peary was not able to establish his base of sledging operations at Sberard Osborn Fiord, on the north coast of Greenland, as he intended, but from his base at Allman Bay, on the west side of the main northward channel, he went north with Eskimos about two hundred and fifty miles across Grinnell Land and Grant Land, arriving in December, 1898, after great difficulties, at Fort Conger, General Greely's old headquarters, at Lady Franklin Bay, $81^{\circ} 44'$ N. This place had not been visited since Greely left in 1883, but the house was in good condition and the original records of the Greely party and many letters and papers were recovered. Four trips were made to Fort Conger, the work of mapping being continued and caches of supplies established along the route. Several members of the party were frost-bitten, and Peary himself suffered so severely that he was obliged to return to the *Windward*, where several of his toes were amputated. The most northerly point reached by Peary was Cape Beechey, about 82° N. When the ice opened in August, 1899, the *Windward* was sent back for a store of supplies; after being refitted the ship was to proceed north again as far as possible, and there probably remain until needed by Peary for his own return voyage. No effort was made by the Peary party in the summer of 1899 to push northward, and winter quarters for 1899-1900 were established on the Greenland side of Smith Sound, several miles farther south than the quarters on the west of the main channel during the previous year. It was expected that the attempt to reach the Pole would be made in the spring of 1900.

The Diana.—In the summer of 1899 the Peary Arctic Club sent the steam sealer *Diana*, 427 tons, north to communicate with Lieutenant Peary and land more than a year's supplies for the party. The ship crossed Melville Bay, and on August 12 found Peary at Etah. Aboard the *Diana* was a scientific party, headed by Professor William Libbey, of Princeton University, and Dr. Robert Stein, United States Geological Survey. The latter, with two companions, was landed at Cape Sabine, Ellesmere Land, where they expected to remain for one or two years. Apparently no definite plans were made for communicating with these men during 1900. Returning, the *Diana* coaled direct from the seams on Disco Island, and arrived at Sydney, Nova Scotia, on the 12th of September.

The Sverdrup Expedition.—Captain Otto Sverdrup, who sailed from Christiania on the *Fram*, June 24, 1898, in command of an expedition, wintered near Cape Sabine, about fifty miles south of Peary's ship, the *Windward*. During the winter the surgeon to the expedition died. The *Fram* was near Littleton Island, $78^{\circ} 25'$ N., on August 18, 1899, and small hopes were entertained of proceeding much farther before winter. Previous to this, Sverdrup had made some explorations in Ellesmere Land. He wishes to push his way north in the *Fram*, through Kane Basin, and thence northeast, across the north shore of Greenland, coming south again on the east side of the island, much of which is unexplored. Sverdrup's experience tends to confirm the opinion of Professor Nansen, that approach to the Pole by ship can be made most easily through the Siberian Arctic.

The Wellman Expedition.—The expedition, consisting of four Americans and five Norwegians, which, conducted by Mr. Walter Wellman, sailed from Tromsø, Norway, on June 26, 1898, in the ice-steamer *Fridtjof*, returned to that port on the *Capella* August 17, 1899, after passing the winter in Franz Josef Land. Mr. Baldwin, meteorologist from the United States Weather Bureau, and Mr. Harlan, the physicist, accompanied the expedition; but Professor Gore, of Washington, who had intended to go, was unable to do so. The party was well equipped and had eighty-three Siberian dogs, which were taken aboard at Archangel. The *Fridtjof* then steamed northward until the pack-ice was encountered on July 9, near the 77th parallel of latitude. The supply of coal running short, the ship was obliged to put back to Norway; but by July 20 had again reached the ice, through which it finally succeeded in finding a channel, and on the 27th Franz Josef Land was sighted. Unable to make much progress through any of the channels of the Franz Josef archipelago, the party established winter quarters at Cape Tegetthoff, 80° N., on the southern part of Hall Island, and the *Fridtjof* sailed for home on August 3, 1898. Almost immediately a small party set out to establish a depot as far north as possible. After a struggle that lasted a month they reached Cape Heller, about 81° N., where a hut was built, which was named Fort McKinley, and was left in charge of two Norwegians, Paul Bjoervig and Berut Bentzen, both experienced Arctic travellers. It was only a few miles from Fort McKinley that Nansen and Johansen passed the winter of 1895-96.

For the rest of the party a hut was built at Cape Tegetthoff. Here during the winter Mr. Baldwin and Mr. Harlan carried on a series of scientific observations,

giving especial attention to the study of the aurora borealis and making continuous barograph, thermograph, and anemometric records; while Dr. Edward Hofma, naturalist and surgeon to the expedition, made a study of flora and fauna. Before the sunless period, which lasted one hundred and twenty-seven days, had expired, Mr. Wellman and three Norwegians, on February 18, 1899, set off for Fort McKinley, which was reached about the end of the month after a journey of great difficulty. Here they found that Bentzen, having fallen ill in November, had died on January 2, and that Bjoervig having promised his dying companion that "the bears and foxes shouldn't get him," had kept watch over the body through two months of the Arctic night.

After the burial of Bentzen the sledging journey northward was resumed, and by March 20 a point was reached on the floe off the east coast of Rudolf Land, near the 82d parallel. At this time the prospects, if not of reaching the Pole, at least of going beyond Nansen's "farthest-north" point, $86^{\circ} 14'$, were very good; an accident, however, brought the party disappointment. Mr. Wellman fell into a crevice and injured his leg so severely that the men were soon forced to turn back and drag their leader two hundred miles to Cape Tegetthoff, where they arrived on April 9, 1899. Subsequently, Mr. Baldwin led a party through parts of Franz Josef Land and made some new maps and charts; after the arrival of the *Capella*, which was sent after the expedition, some twenty new lands or islands of the archipelago were discovered. As the party were leaving on the *Capella* they met, August 9, the Abruzzi expedition, which was in search of winter quarters, and expected to make a dash for the Pole in the spring of 1900.

The Abruzzi Expedition.—On June 12, 1899, the Duke of Abruzzi sailed from Christiania on the *Stella Polare* in command of an expedition whose purpose was to find the Pole. The party expected to winter in Franz Josef Land and start northward in the spring of 1900. On its return the Wellman expedition in the *Capella* met the *Stella Polare* on August 9, 1899, in the British Channel, lat. $80^{\circ} 20'$, with good chances of proceeding some twenty or thirty miles farther north before stopping for the winter. It was reported that subsequently a pigeon-post from Abruzzi stated that he was passing the winter near the site of "Nansen's hut," on one of the islands of Franz Josef Land, not far from the 81st parallel. The party had an exceedingly good equipment, including 120 dogs, and it was believed by Mr. Wellman that of the several explorers in the Arctic regions at the close of 1899, Abruzzi had the best chance to advance beyond the "farthest north" point of Professor Nansen.

The Nathorst Expedition.—In May, 1899, Dr. A. G. Nathorst, who in 1898 conducted an expedition to Spitzbergen, sailed for East Greenland, primarily for the purpose of finding some trace of S. A. Andrée, the balloonist. The secondary object of the expedition was one of exploration and discovery. On returning in September, Professor Nathorst reported that no trace of Andrée had been found, but that successful explorations had been made in the region of Franz Josef Fiord. His investigations completely changed the map of this fiord. The coast was further charted, many new inlets and a magnificent new fiord, which was named for King Oscar, were discovered, geological investigations were made, and a valuable ethnographic collection was secured.

The Monaco Expedition.—In 1899 the Prince of Monaco again conducted an expedition to Spitzbergen in his yacht the *Princesse Alice*; he succeeded in accomplishing some oceanographical work, and in making a number of very good surveys of parts of the coast.

The Andrup Expedition.—In August, 1898, Lieutenant Andrup left Copenhagen in command of a Danish expedition to the polar regions. The party returned in September, 1899, after exploring the Greenland coast from Agmasalik, $65^{\circ} 45' N.$, to a point $67^{\circ} 30' N.$

The Russian Ice-Breaker.—The success in 1899 of the *Ermak*, the recently constructed Russian ice-breaker, in forcing a passage through polar ice, points to a new method, in the opinion of a number of experts, of attempting to reach the ultimate north. Though ice-breakers have been constructed for over thirty years, especially for keeping open Russian ports, none have achieved such eminent success as the *Ermak*. This vessel, which was built at Walker-on-Tyne, is 305 feet long, 71 feet wide, and 42 feet 6 inches deep, and has a displacement, with 3000 tons of coal on board, of 8000 tons. It is a quadruple-screw steamer, having at the stern, besides the ordinary single screw on the centre line, twin-screw propellers, and a screw at the bow. The bow-screw is not designed for accelerating the speed of the vessel, but for clearing away loose masses of ice that tend to accumulate under the ship. The steel hull of the *Ermak* is so modelled that lateral pressure tends not to crush but simply to lift up the ship. Its method, accordingly, of forcing a way through an ice-bound harbor, is not to cut the ice, but to run the prow upon it and break it by the weight of the vessel. The *Ermak* has already done good service in

opening several of the Russian ports, and it was for this purpose, especially for keeping open in winter a passage from St. Petersburg through the Baltic, it was designed by Vice-Admiral Makaroff, of the Russian navy.

To submit the ice-breaker to a most severe test, and with the hope of demonstrating a new method of Arctic exploration, Admiral Makaroff for five weeks in July and August, 1899, experimented in the floe north of Spitzbergen, pushing through 230 miles of polar ice, which was first struck by the ship in latitude $80^{\circ} 15'$. The ship with little difficulty stood through plain ice 10 feet in thickness, and finally succeeded in overcoming plain ice of 14 feet; while satisfactory progress was made through pack-ice that was sometimes 18 feet high and 42 feet deep. In her trials in the North Sea the *Ermak* reached a speed of nearly $15\frac{1}{4}$ knots with 8000 horse-power; the usual rate in the polar regions was $3\frac{1}{4}$ knots. So successful was Admiral Makaroff that he believes a ship of the character of the *Ermak*, with some improvements that can be made, could navigate almost any part of the Arctic waters.

ARECOLIN. To an alkaloid obtained from the areca nut has been given the name arecolin. The hydrobromate of arecolin is a white, crystalline, soluble salt, which is used in medicine. When applied to the eye in the form of a 0.5 per cent. or 1 per cent. aqueous solution, contraction of the pupil results, says Clemensha, in *Buffalo Medical Journal*, 1899. A 0.5 per cent. solution, dropped into the conjunctival sac, causes burning and slight congestion. In from three to five minutes the pupil begins to contract, and its maximum contraction is reached in from ten to fifteen minutes, accompanied by spasms of the ciliary muscle. After this the contraction ceases and the pupil returns to its normal condition, usually in the course of an hour or two. In the normal eye tension is apparently unaffected, but in glaucoma the drug appears to be the equal of eserine in its action—that is, it contracts the pupil strongly, drawing away the base of the iris from the angle of the anterior chamber, thus relieving tension.

ARGENTINA, a republic of southern South America, is bounded on the north by Bolivia and Paraguay; on the east by Paraguay, Brazil, Uruguay, and the Atlantic Ocean; on the south by the Atlantic Ocean and Chile, and on the west by Chile. Its capital is Buenos Ayres, a port at the mouth of the river Plata.

Area and Population.—The estimated area of the 14 provinces and the municipality of Buenos Ayres in May, 1895, was 515,815 square miles, and of the 9 territories, 1,262,380, making a total area of 1,778,195 square miles. The largest province is Buenos Ayres, exclusive of the city, which comprises 63,000 square miles; and the smallest is Tucuman, a northern province, with 13,500 square miles. Of the territories, Santa Cruz has the largest area, with 182,500 square miles; and Terra del Fuego, the smallest, with 13,000. The total population of the country in 1899 was estimated to be over 4,000,000. According to the census of May, 1895, the population was 3,954,911, of which only 103,369 were reported from the territories; the males numbered 2,088,919, and the females 1,865,992. The population per square mile is largest in the province of Santa Fé, 22; and smallest in the territory of Santa Cruz, 0.005. There are about 30,000 Indians. The city of Buenos Ayres, which governmentally is separate from the province of the same name, had in 1895 a population of 663,854, or 5784.7 per square mile; in May, 1899, its population had increased to 776,325. This is the largest city in South America. Other cities, with populations from the census of 1895, are: Rosario, 94,025; Cordoba, 47,609; La Plata (the new capital of the province of Buenos Ayres, founded in 1884), 45,410; Tucuman, 34,300; Mendoza, 28,709; Santa Fé, 24,755; Paraná, 24,261; Salta, 16,600; Corrientes, 16,129; San Juan, 10,410; San Luis, 9826. Immigration into Argentina has been fluctuating, but from 1891 to 1896 there was an annual increase. In the latter year the immigrants (exclusive of the passengers from Montevideo, who are not usually counted among immigrants) numbered 102,673; including the passengers from Montevideo, 164,218; the emigrants numbered 20,415. In 1897 the immigrants numbered 72,978, of whom 51,547 were males and 21,431 females; of the total, 38,745 were Italians, 13,059 Spaniards, 7813 French, 1876 Germans. The emigrants for this year numbered 31,192. The whole number of immigrants for the term of years 1873-97, inclusive, was 2,063,232. The foreigners in Argentina in 1895 numbered 886,895, representing various nationalities, as follows: Italian, 492,636; Spanish, 198,685; French, 94,098; English, 21,788; German, 17,143; Swiss, 14,789; Austrian, 12,803; Portuguese, 2269; other nationalities, 32,184.

Government.—The constitution of "La República Argentina" is dated May 15, 1853, and was modified in 1860, when Buenos Ayres joined "Las Provincias Unidas del Rio de la Plata." By the provisions of the constitution, which, with minor exceptions, is like that of the United States, the executive authority is vested in a president, elected for a term of six years by representatives of the fourteen provinces, comprising twice the number of federal senators and deputies combined.

Appointed by the president and acting upon his orders, is a ministry, which with himself is responsible to congress, consisting of eight secretaries of state—namely, for the interior, foreign affairs, justice, agriculture, finance, war, marine, and public works. The president is commander-in-chief of the army and has appointive power to all military, judicial, and civil offices. He is not eligible for re-election. In 1899 Señor Don Julio A. Roca was president; he took office October 12, 1898. The legislative authority devolves upon a congress, consisting of a senate and a house of deputies. The members of the former are 30 in number, and are chosen, two from each province and the municipality of Buenos Ayres, by the legislatures in the provinces and by an electoral college in the municipality. The deputies, numbering 133, each of whom by the constitutional revision of 1898 represents about 33,000 inhabitants, are elected by direct popular vote. Deputies are chosen for a term of four years, half of the number retiring every two years; the senatorial term is nine years, one-third of the senators retiring every third year. Both deputies and senators receive 12,000 pesos a year; senators must be at least thirty years of age and have an annual income of at least 12,000 pesos. The vice-president, who is elected in like manner and at the same time as the president, has no political authority other than that attaching to the chairmanship of the senate. The several provinces have full autonomy so far as their action does not conflict with the federal government; they may contract internal and even external debts on their own responsibility. Their governors and legislatures are elected by popular vote. The federal judiciary consists of a supreme court of five judges and an attorney-general. The several provinces have their own judicial systems. The constitution provides for trial by jury in criminal cases.

Army and Navy.—On a peace footing the army comprises 945 officers and 12,073 privates; a statement made to congress in 1897 places the number of the effective army at 29,513 officers and men. The majority of the national guard, which is reported to number 480,000, are drilled each year. Besides a school for non-commissioned officers, there is a military school, having 125 cadets.

The Argentine navy ranks third in South America, being excelled only by those of Brazil and Chile. It consists of 6 armored cruisers, 3 high-speed, second-class cruisers, 4 coast-defence armorclads, 7 comparatively small but modern cruisers and gunboats, 12 first-class and 10 second-class torpedo boats, 3 destroyers, and several old gunboats. The armored ships are as follows (the first two are coast-defence vessels, the others cruisers): *Libertad* and *Independencia*, launched at Birkenhead in 1890 and 1891, respectively; *Almirante Brown*, built at Poplar in 1880; *Garibaldi*, launched in 1895; *San Martin*, launched in 1896, and *General Belgrano* and *Pueyrredon*, both launched in 1897, and *Rivadaria*. The last-named vessel was built for Spain and the four preceding for Italy. They were purchased by Argentina with the consent of those governments. These vessels are well armed and equipped with modern appliances. Other ships in the navy, including protected cruisers, also have a high degree of efficiency. The government has undertaken to increase the size of the navy. Besides marines, the naval complement is reported to number 4642 officers, engineers, and seamen. There is a naval school with 60 cadets and a school of gunners with 80.

Finance.—The chief sources of revenue are import and export duties, internal taxes, stamps, railways, and public works; the heaviest item of expenditure is interest on the national debt. For 1898 the estimated revenue was 34,759,146 pesos gold and 52,918,000 pesos paper; the estimated expenditure was 22,100,182 pesos gold and 97,881,111 pesos paper. The estimates for 1899 were: revenue, 32,423,500 pesos gold and 67,540,600 pesos paper; expenditure, 29,070,173 pesos gold and 75,782,687 pesos paper.

Separate from the national budget is that of each province and municipality. A law for the unification of the national and provincial foreign debts was enacted in 1896, in pursuance whereof there was subsequently authorized an issue of 4 per cent. bonds for nearly \$33,000,000 for the conversion of the external debt of the province of Buenos Ayres.

The national external debt was in July, 1898, \$301,454,714. A proposed issue of bonds, amounting to \$48,427,757, would bring the total external debt up to \$349,882,471. The amount of this new bond issue was made up of \$32,853,166 for the conversion of the Buenos Ayres provincial debt, \$8,859,017 for the recision of railway guarantees, and \$6,715,574 for the conversion of the Buenos Ayres city debt. The internal debt at the beginning of 1897 amounted to 189,162,500 pesos gold and 45,838,067 pesos paper. Internal bonds in 1898 were issued for military and naval purposes, amounting to 39,000,000 pesos, and for the liquidation of the debt of the department of education internal bonds, amounting to 6,000,000 pesos. In November, 1898, it was reported that the total public debt amounted to £105,000,000 (\$510,930,000).

In the spring of 1899 the government decided to take measures for placing the currency on a gold basis. The notes in circulation amounted to 292,000,000 pesos, and the sum estimated to effect the conversion was 146,000,000 pesos gold. Some authorities considered the plan impracticable, since the annual interest on the gold sum—about \$7,500,000 gold—would be greater than the government could bear, in addition to the other heavy expenditures. For in the summer a great popular protest was made against the heavy taxation already imposed, and a petition, signed by 50,000 people, asking for reforms in the customs laws, etc., was presented to the congress. On October 27, however, though nothing of importance was done to effect economies or reduce taxation, the Chamber of Deputies passed a conversion bill, "the main object of which is to arrest the further appreciation of the currency, to sell the Transandean Railway, in the hope of receiving thereby £1,400,000, to issue £1,500,000 national *cédulas* [notes] in the London market, and, lastly, to negotiate over £1,000,000 of home debt stock of 1891."

Besides numerous private banks and the Bank of the Argentine Nation, there are 14 state banks. In August, 1897, the paper currency of the country amounted to 285,115,964 pesos; the total coinage up to 1899 has been reported as 31,716,545 pesos gold and 2,805,840 pesos silver. The value of the peso is \$0.965 United States currency.

Industries.—Cattle raising is the most important industry; agriculture ranks second, and efforts are being constantly made for its development. Of the 240,000,000 acres of tillable land in the republic there were under cultivation in 1896 only about 15,000,000 acres. The leading crop is wheat; others of importance are maize, grapes, sugar, and flax. The four principal cereal-producing provinces are Santa Fé, Buenos Ayres, Cordoba, and Entre Rios. The wheat area is gradually increasing, chiefly toward the south, where there is greater security from the locust pest than in the northern districts. The total wheat crop of 1899 was estimated to be 2,200,000 tons and the export 1,400,000 tons. The amount of corn exported and ready for export was placed at 2,000,000 tons. Rivalry between the United States and Argentina in the export of wheat and Indian corn is increasing. Three of the chief wool-producing districts of the world are Australia, South Africa, and the Plata regions of Uruguay and Argentina; in the former districts there has been a great decrease, but in the latter district an increase of the sheep stock. The present number of sheep in Argentina is placed approximately at 85,000,000; in Uruguay, 17,000,000; this is, an increase for the two countries since 1890 of over 20,000,000. Rich deposits of borax, borate of soda, and borate of lime have been discovered in the provinces of Salta, Jujuy, and Atacama, on the Chilean frontier; and though exploitation has begun, the industry has not yet been well developed. In the summer of 1899 a flood in the Chubut valley did great damage to property and caused much distress.

Commerce.—The chief exports of Argentina are the produce of the herds and agricultural products, notably wheat and maize; the leading imports are textiles and wearing apparel, iron, and iron and steel implements, and machinery. The value, in gold pesos, of exports and imports, exclusive of coin and bullion, has been:

	1897.	1898.
Exports, dutiable.....	61,855,000	71,472,647
" free.....	39,314,299	62,356,811
Total.....	101,169,299	133,829,458
Imports, dutiable.....	85,699,748	93,988,545
" free.....	12,589,200	13,440,355
Total.....	98,288,948	107,428,900

Exports and imports for the first six months of 1899 were reported at \$89,050,762 and \$57,452,942 respectively. Of the exports about 67 per cent. and of the imports about 85 per cent. pass through the port of Buenos Ayres. The trade for 1898 by countries was in gold pesos: Exports to France, 29,981,056; Germany, 20,286,338; Great Britain, 19,205,908; Belgium, 13,949,751; Brazil, 7,916,301; United States, 5,874,295; Italy, 5,256,054; the remainder, in smaller amounts, to various other countries: imports, from Great Britain, 32,012,600; Italy, 13,695,241; Germany, 12,571,116; United States, 11,129,075; France, 10,596,725; Belgium, 9,444,981; Brazil, 5,012,115; the remainder from other countries. In 1898 about 4½ per cent. of the total Argentine exports went to the United States, the remainder going chiefly to Europe. Of the total imports about 10½ per cent. came from the United States. Some of the important exports in 1898 are reported as follows: Wheat, 645,161 tons;

maize, 717,105 tons; linseed, 158,904 tons; flour, 31,933 tons; hay, 113,534 tons. The total exports of wool in 1897 amounted to 469,451 bales; in 1898, 514,773 bales. Near the close of the year it was estimated that the value of the wool exported during 1899 would be about \$70,000,000, gold. In the first half of 1899 there were exported 1,078,819 tons of wheat. During the same time there was a general falling off in pastoral produce, hides, skins, etc. The number of cattle slaughtered in Argentina for packing purposes in fiscal years has been reported as follows: 1896, 449,400; 1897, 476,200; 1898, 337,500; 1899, 310,700. Statistics, based on the returns for the first six months of 1899, indicate that the total trade of Argentina for the year amounted to about \$293,000,000, gold. In the summer of 1899, after the outbreak of bubonic plague at Oporto, Portugal, the Argentine government established a strict quarantine, which caused much inconvenience to travel and commerce.

Shipping.—Vessels engaged in the foreign trade at the Argentine ports numbered in 1896: Steam, 7791, aggregating 6,331,879 tons; sail, 4039, aggregating 783,588 tons; total, 11,830 vessels of 7,115,467 tons. In 1897: Steam, 6827, of 5,522,973 tons; sail, 3536, of 541,091 tons; total, 10,363 vessels, aggregating 6,064,064 tons. The Argentine merchant marine in 1898 consisted of: Steam, 86 vessels, of 31,976 tons net, and sail, 157 vessels, of 39,695 tons net.

Communications.—Toward the close of 1899, the railroad mileage for Argentina was reported at 15,884 kilometres (9870 miles), giving this country the seventh position in the world. Austria-Hungary, occupying the sixth position, has 31,794 kilometres (19,756 miles), and Brazil and Mexico, eighth and ninth, have 14,035 kilometres (8722 miles) and 13,369 kilometres (8307 miles) respectively.

Buenos Ayres is connected by rail with the principal cities of the country. In 1896 the capital invested amounted to 510,643,296 pesos gold; the gross receipts were 31,238,326 pesos gold, and the expenses 15,934,466 pesos gold. Some lines are under federal control, some under provincial, and some under private. It was announced in the summer of 1899 that the construction of a network of underground electric railways would be attempted in the city of Buenos Ayres. In 1896 there were 25,345 miles of telegraph lines with 59,060 miles of wire. There were in Buenos Ayres in 1899, 362 kilometres (225 miles) of horse railways and 63 kilometres (39 miles) of electric railways.

Education.—An educational system similar to that of the United States was introduced in Argentina in 1868 by Don Domingo F. Sarmiento, formerly minister to the United States, who was elected president in that year. The latest report of the United States Commissioner of Education states that \$17,551,363, or six per cent. of the national revenue, was spent by the nation in education of all grades. Over five million and a half of dollars was appropriated for secondary, higher and special education, including the universities of Buenos Ayres and of Cordoba, 2838 public schools, with secondary and 37 normal schools, a school of mines, two schools of commerce, one with an industrial department, an institution for deaf mutes, and a school for pilots. Private schools bring the total of schools of all kinds up to 3986. There were 365,841 pupils and 10,295 teachers in the public schools. The kindergarten has been introduced in the primary schools, and the regular course of public school education includes reading, arithmetic, history, geography, natural sciences, drawing, writing, geometry, music, manual training, hygiene, and the French and Spanish languages. A commercial school was opened in July, 1897, in Buenos Ayres with a two-year course of study, which included bookkeeping and typewriting. The school for pilots was founded in 1895, and has matriculated 50 pupils. "There is a three-year course of study, as follows: First year, elementary mathematics, arithmetic, algebra, and geometry, rigging, and the national language; second year, navigation by dead reckoning, rigging, natural geography and history, English, plane and spherical trigonometry; third year, navigation by astronomy, meteorology, rigging and working ship, universal geography and English. On the termination of the annual examinations the pupils make a practice voyage, and, if possible, by consent of the Minister of Marine, make two round trips to the Straits of Magellan, or if that be not possible, the director of the school obtains permission from the minister for them to make a voyage on the national practice-vessel. The director, subdirector, or one of the professors accompanies the pupils on the voyage, and uses every opportunity of instructing the pupils. On the termination of the voyage the director makes a report to the minister of the time employed in the various exercises and names pupils who are worthy of promotion. The pupils in the second year must always keep the dead reckoning of the ship, and those of the third year take astronomical observations to determine the vessel's position. Both the second and the third year pupils must take meteorological observations, and learn while on board the principles of meteorology and the use of the signals of the international code."

The Argentine-Chilean Boundary.—In the fall of 1898 commissioners were ap-

pointed to investigate the disputed question of the Argentine-Chilean boundary, and they subsequently failed to reach an agreement. The demarcation of Puna de Atacama was submitted to the arbitration of Mr. William I. Buchanan, United States Minister at Buenos Ayres. Bolivia had ceded to Argentina the territory in dispute. Chile demanded that it be divided, while Argentina claimed a right to the whole. The decision awarded Chile about eight hundred leagues, or one-fourth of the disputed territory. In 1898 the Chilean-Argentine dispute concerning the boundary to the south of the Atacama district was submitted to the arbitration of the British government; on February 15, 1899, this government appointed as arbitrators Baron Edward MacNaghten, General Sir Charles Ardagh, and Colonel Sir Thomas H. Holdich.

Official Visit.—In the summer of 1899 an Argentine delegation, headed by President Roca, paid an official visit to the president of Brazil. On August 8 they were welcomed at Rio de Janeiro, and festivities were arranged to last for nine days. On the way President Roca had called upon President Cuestas at Montevideo. These two incidents caused a rumor of a political alliance between the countries, but when the Argentines left Brazil it was believed that none had been effected.

Researches in Patagonia.—Scientific exploration in Patagonia was continued in 1899 by Professor J. B. Hatcher, of Princeton University, who returned to the United States in August. His assistant, Mr. O. E. Peterson, returned the following month. The exploring party, after reaching the Straits of Magellan, established its headquarters at Sandy Point. Proceeding from this place, the scientists made careful observations of the geological formation of the country, with special reference to vertebrate and invertebrate fossils. This primary object of the expedition was highly successful in the collection of a large number of fossils; in addition, many ethnological, zoological, and botanical specimens were taken. In the interior of the country the party found the first Mesozoic mammals ever discovered, and about thirty cases of vertebrates of the Mesozoic period were shipped to the United States. Hitherto an insufficient number of specimens from this region of the far south has rendered inadequate a scientific comparison between the Northern and Southern forms, and it is now thought that the results of the expedition will settle a number of geological and paleontological questions that have been matters of controversy. Professor Hatcher also obtained valuable information concerning the Patagonian natives. Mr. Peterson, whose additional investigations were made along the seacoast, secured a rare and valuable collection of bird and fish fossils.

ARID LANDS. See IRRIGATION.

ARIZONA, a southwestern Territory of the United States, has an area of 113,920 square miles. The capital is Phoenix. Arizona was organized February 14, 1863.

Agriculture.—The principal crops of the calendar year 1899 were wheat, 342,139 bushels, valued at \$218,969, and hay, 72,651 tons, valued at \$751,938. Live stock, January 1, 1900, comprised horses, 52,431, \$1,417,338; mules, 1,031, \$38,477; milch cows, 19,140, \$622,050; other cattle, 362,721, \$5,969,293; and sheep, 1,024,430, \$2,393,581.

Mining.—Never before in the history of the Territory was there so much interest manifested in mines and mining as during the calendar year 1899. Copper continued to show the most active development. Almost every copper mine and smelter were worked to their full capacity, and the railroads handled nearly eight times as much ore as in 1896 and 1897. From January till June more mines changed hands in Pima County than during the previous ten years, and from January till October 250 mining claims were recorded in Gila County alone. Fully 16,000 men have been constantly employed at good wages in Arizona's copper mines and smelters for two years, and almost weekly strikes in various counties promise a prolonged era of prosperity.

One of the most notable movements in mining properties was the sale of the Helvetia group of mines to a corporation for \$4,499,000. The great United Verde mine at Jerome, owned by United States Senator Clark, of Montana, is now considered the most profitable mining property in the world. The main production is copper, but the ore is known to contain high values in gold and silver. In copper alone the monthly output exceeds \$1,000,000, and in 1898 the net profit was \$8,600,000. Senator Clark, who has spent millions of dollars on his plant, has refused \$100,000,000 for the mine and its works. The deepest workings are now 700 feet, but an exploration in 1899 by means of a drill showed a continuation of the ore body to a depth of 2000 feet.

Gold-mining on a large scale was undertaken in the Cañon Del Oro country, in which early Mexican prospectors had acquired interests. These and some adjoining interests were bought up by a capitalist, and by midsummer fully 50 claims had been staked out in this one belt. Late in the year a new platinum and aluminium

strike was made in Cataract Cañon, in a clay deposit. Samples assayed \$328 in platinum and 28 per cent. aluminium. A number of abandoned copper and gold claims in the Dragon Mountain region were opened up during the year, and with modern methods yielded profitable results. An important discovery was that of anthracite coal, comparing favorably with the Pennsylvania product, near the border of Arizona and Sonora.

Probably the most valuable discovery of the year was that established through the agency of the Arizona School of Mines. Samples of nuggets found in large quantities in the Dragon and Gila mountains were determined to be wolframite, from which tungsten is produced. Prospecting showed that this mineral is not found elsewhere in the world in so large quantities. The total annual product has not exceeded 1000 tons, and the demand is always far ahead of the supply. The largest known body of wolframite is believed to be that in the Gila Mountains, near Arivaca, and it is supposed that this region alone is capable of yielding several times more than the present entire output of the world.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise in the customs district of Arizona were valued at \$1,485,231, a decrease in a year of \$272,191, and the exports were valued at \$1,518,380, an increase of \$329,999. The imports of gold and silver amounted in value to \$3,005,782, an increase of \$306,156, making the total trade of the year \$6,009,393.

Railways.—The total new railway construction during 1898 was reported at 99.40 miles, giving the territory a mileage of 1416.18 in 1899. This mileage is believed to be below the actual total, for, in addition to extensions of trunk lines, there was a large construction to aid the development of mining property.

Banks.—On October 31, 1899, there were 5 national banks in operation and 3 in liquidation. The active capital aggregated \$400,000; circulation, \$166,528; deposits, \$2,062,181, and reserve, \$795,087. Territorial and private banks numbered 3, and had capital, \$229,700; deposits, \$1,368,007, and resources, \$1,671,768.

Education.—Revised reports for the school year 1897-98 show a school population of 22,120, an enrolment of 14,613, and an average daily attendance of 9011. The revenue was \$235,381; expenditure, \$229,323, of which \$175,031 was for teachers' salaries. There were 2 public high schools, with 8 teachers and 156 students; 1 private secondary school, with 2 teachers and 8 secondary students, and 70 elementary pupils; and 1 public normal school, with 6 teachers and 171 students. The University of Arizona, at Tucson, reported 14 professors and instructors, 157 students, 3400 volumes in the library, \$40,000 invested in scientific apparatus, and \$85,000 in grounds and buildings, and \$48,700 in total income. In 1899 there were 52 periodicals, of which 10 were dailies and 40 weeklies.

Finances.—In 1899 the assessed property valuations aggregated \$32,509,520, an increase in a year of \$1,036,161, and the Territorial tax rate was \$8.50 per \$1000. The total debt, April 1, 1899, was \$2,855,237, including a floating debt of \$152,237, from which should be deducted the aggregate of county, city, and school district debts, \$1,634,028, leaving the net territorial debt, \$1,221,209, less cash in the general fund, \$82,755. The last official estimate of actual property valuations was in 1896, when, excluding mines in operation, the total was given as \$64,000,000.

Needs of the Territory.—Governor Murphy, in his annual report for 1898-99, renewed his plea for Statehood, and made a number of recommendations which he deemed necessary for the welfare of Arizona, whether it remained a Territory or became a State. Among these were that all public lands within Arizona be ceded to the Territory or State, pending which the Territory should be permitted to lease the grazing lands; that all lands within the Territory, especially the railroad grants, be surveyed for taxing purposes; that a mint or assay office be established; that a commission be created by Congress for ethnological and archæological research, also, a fifth judicial district; and that Congress appropriate sufficient money to pay territorial governors and secretaries the salaries allowed them by law.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 83,000.

Legislation.—The age of consent was raised from fourteen to seventeen years. Eminent domain was granted to pipe-line companies. The amount of property exempt from taxation belonging to heads of families was reduced from \$1000 to \$500, and homesteads from \$4000 to \$2500. It was made a misdemeanor to deface or show disrespect to the national flag. Property acquired by either husband or wife during marriage was declared common property, only to be alienated by both joining in the deed. Attendance at school was made compulsory. Railroads commenced within one year and constructed at the rate of twenty-five miles each year are to be exempt from taxation for ten years, and when canals and reservoirs for distribution of water for mining, manufacturing, and agricultural purposes shall be commenced within one year, they shall be exempt for fifteen years.

Territorial Officers and National Representative.—Governor, N. O. Murphy; secretary, Charles H. Akers; treasurer, T. W. Pemberton; auditor, G. W. Vickers; adjutant-general, H. P. Robinson; attorney-general, C. F. Ainsworth; superintendent of education, R. L. Long. Supreme Court: Chief Justice, Webster Street; associate justices, Richard E. Sloan, Fletcher M. Doan, George R. Davis; clerk, Lloyd Johnston. Delegate to Congress, J. F. Wilson (Dem.), from Tucson. The territorial legislature consists of 22 Democrats and 14 Republicans.

ARIZONA ANTIQUARIAN ASSOCIATION. See ANTHROPOLOGY IN AMERICA.

ARKANSAS, a south central State of the United States, has a land area of 53,045 square miles. The capital is Little Rock. Arkansas was admitted to the Union June 15, 1836.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 48,067,140 bushels, \$18,273,113; wheat, 1,953,361, \$1,250,151; oats, 5,964,442, \$2,027,910; potatoes, 1,773,198, \$1,258,971; rye, 19,052, \$14,098; and hay, 205,491 tons, \$1,777,497. The farm animals, January 1, 1900, comprised horses, 234,127, \$7,817,264; mules, 142,594, \$6,348,660; milch cows, 188,936, \$3,825,954; other cattle, 230,486, \$3,235,910; and sheep, 108,957, \$181,795. See COTTON AND THE COTTON INDUSTRY.

Banks.—On October 31, 1899, there were 7 national banks in operation and 7 in liquidation. The active capital aggregated \$1,070,000; circulation, \$242,548; deposits, \$2,651,582, and reserve, \$881,030. The State banks, June 30, 1899, numbered 37, and had capital, \$1,152,914; deposits, \$3,730,329, and resources, \$5,712,601.

Education.—At the close of the school year 1897-98, the school population was 465,565; enrolment in public schools, 303,808, and average daily attendance, 191,447. There were 7073 teachers, 4936 buildings used as schoolhouses, and public school property valued at \$2,294,397. The revenue was \$1,255,446; expenditure, \$1,220,362, of which \$1,065,288 was for teachers' salaries. Forty-eight public high schools reported 118 teachers, 2786 secondary students, and 1040 elementary pupils; and 24 private secondary schools, a total of 75 teachers and 2766 students and pupils. One public normal school reported 7 teachers and 190 students, and 6 private ones, 36 teachers and 405 normal students. Normal training was also given in 3 colleges and 15 public high schools. Eight colleges for men and for both sexes had together 8 scholarships, 108 professors and instructors, 1636 students, 22,700 volumes in the libraries, \$33,500 invested in scientific apparatus, \$495,000 in grounds and buildings, and \$150,500 in productive funds, and had \$112,591 in total income. The Central Baptist College (for women) had 11 professors and instructors, 130 students, \$30,000 invested in grounds and buildings, and \$14,000 in total income. In 1899 there were 299 periodicals, of which 21 were dailies, 212 weeklies, and 19 monthlies.

Finances.—The assessed property valuations in 1899 were: Real estate, \$119,980,700; personal property, \$59,191,298; total, \$179,171,998, an increase over the total of 1897 of \$1,745,872, real estate showing an increase of more than \$2,000,000, and personal property a decrease of \$361,575. The recognized bonded debt October 1, 1898, was \$882,000; overdue interest, \$683,580; total debt, \$1,565,580, a decrease from the total of 1896 of \$2,653,172, caused by the surrender of bonds and coupons held by the United States under the terms of the federal debt settlement of 1898. Besides this indebtedness, there was outstanding on the above date State scrip and sinking-fund notes to the amount of \$480,286, all of which was called in for payment August 1, 1899. Of the total bonded debt, individuals held \$67,000 of principal and \$123,975 of interest claims. The United States still holds \$160,000 in bonds, one-half of which is to be paid off on or before September 1, 1900, and the other half by September 1, 1901. The unrecognized debt aggregated \$8,706,773, of which \$1,200,000 was due January 1, 1899, \$6,156,773 on January 1, 1900, and \$1,350,000 on April 1, 1900.

Railways.—During 1898 Arkansas was exceeded only by Minnesota in the amount of new railroad construction, the aggregate being 224.28 miles, and in 1899 the construction was 269.48 miles, making the total mileage of the State 3092.77. At the session of the legislature in 1899 a commission was created to regulate railroad and express companies, with authority to fix rates. The penalty for the failure of a company to submit to an order of the commission is from \$100 to \$1000 fine for each day of dereliction, and it is not to be suspended pending an appeal to the Supreme Court.

Insurance.—In the early part of 1899 there were 63 fire insurance companies with headquarters elsewhere that were doing business in the State. The anti-trust law of the legislature of 1899, which prohibited companies from doing business in the State that were members of any association or combination to fix rates on business outside the State, caused the withdrawal of all these companies and left only two mutual companies, holding State charters, at work. On May 27, however, the Arkansas Supreme Court handed down a decision declaring the new law invalid.

Mining Troubles.—Early in the year union coal miners in Sebastian County went on a strike, and the operating companies undertook to supply their places with imported help. Judge Rowe, of the State Court, issued an injunction against such importations, and Governor Jones directed the State authorities to enforce the injunction. A reign of terror existed in the mining region throughout the summer; hundreds of men were imported by the mining companies from Kentucky, West Virginia, and Alabama, and both the union miners and the imported help were armed for a threatened riot. On September 9, Judge Rogers, of the United States Court, delivered an opinion to the effect that the United States Court had jurisdiction over the action of the State Court in issuing an injunction restraining coal companies from importing miners and railroad companies from transporting such miners from another State into Arkansas, and that no State has a right to prohibit the incoming of people from other States not within the classes usually prohibited by State constitutions. The injunction of the State Court was dissolved. The total output of coal in the calendar year 1898 was 1,205,479 short tons, valued at \$1,238,778, an increase of 856,190 tons in a year. Seventeen mines were worked.

Population.—As estimated by federal officials on June 30, 1899, the population was about 1,435,000.

Legislation, etc.—In 1900 the people are to vote upon an amendment authorizing surety companies to be taken on official bonds. Among the legislative measures of the year the following may be mentioned: Physicians and trained nurses cannot be compelled to testify as to information acquired from a patient. Cigarettes must not be sold or given to any one under twenty-one years of age, nor tobacco to a minor under fifteen. Employees of mills and factories must be paid in currency, and advance payments must not be discounted more than ten per cent. per annum. Coal must be weighed before screening as the basis for miners' pay. A railroad commission was established with power to fix rates and maintain control and supervision over railroads. Physiology and hygiene must be taught in the schools with special reference to the effect of alcohol upon the human system. Marriage following seduction does not terminate prosecution, and the wife may be a witness against her husband. Trusts, pools, combinations, and confederations to regulate or fix the price of any article of manufacture, merchandise, commodity, etc., or to maintain such prices were prohibited, and corporations, partnerships, or individuals entering therein are declared guilty of conspiracy to defraud, and shall forfeit from \$200 to \$5000 for each day's offence, with forfeiture of charter if a corporation; and every corporation is required to file each year an affidavit of some principal officer that it has not entered into such combination. An act authorized the letting out of paupers to the lowest bidders who give bonds that they will provide them with shelter, clothing, food, and medical attendance. Among the other legislative measures of the year may be mentioned: An act declaring that a husband is not liable for his wife's ante-nuptial debts except by virtue of written contract; an act requiring a foreign corporation to file its charter with secretary of state, and designate agent on whom process may be served; a provision for the funding of the State debt at 3 per cent. interest for 30 years; the admission of claims against the State for taxes erroneously collected if presented two years after discovery of error; declaring taxpayers on unimproved lands in possession when they have paid taxes for seven years; and acts making it a misdemeanor to procure liquor for another in prohibited districts, and requiring judicial officers on information or their own knowledge and belief to issue warrants to search for and destroy liquors in such districts.

State Officers and National Representatives.—Governor, Daniel W. Jones; secretary of state, Alex. C. Hull; treasurer, Thomas E. Little; auditor, Clay Sloan; attorney-general, Jefferson Davis; superintendent of education, J. J. Doyne; commissioner of agriculture, Frank Hill; land commissioner, J. W. Colquitt; supreme court chief justice, Henry G. Bunn; associate justices, Simon P. Hughes, C. D. Wood, Burrill B. Battle, James E. Riddick; clerk, P. D. English. The State legislature comprises 130 Democrats and 2 Republicans. Senators: James K. Jones, from Washington, and James H. Berry, from Bentonville—both Democrats. Representatives: P. D. McCulloch, Jr., from Marianna; John S. Little, from Greenwood; Thomas C. McRae, from Prescott; Wm. L. Terry, from Little Rock; Hugh A. Dinsmore, from Fayetteville; S. Brundidge, Jr., from Searcy—all Democrats.

ARMENIA, a portion of the Turkish empire in Asia Minor, comprising the three vilayets of Erzerum, Diabekr, and Mamouret ul Aziz and the two districts of Van and Bitlis, with an area of 72,491 square miles and an estimated population of 2,472,400; but the estimates of area and population vary, and some figures give the former as much as 90,000 square miles and the latter as much as 5,000,000. In recent years, owing to the disturbed condition of the country, and especially to the massacres by the Turks, a large part of the population has emigrated. In 1899 there was great destitution in the country, and it was reported that many thousands were

dependent upon charity and that the country was threatened with famine. See **TURKEY**.

ARMIES. See articles on the separate countries.

ARMSTRONG, Sir ALEXANDER, K.C.B., LL.D., died July 6, 1899, at the age of eighty-one years. He was born in Ireland and was educated at Trinity College, Dublin, and at the University of Edinburgh. He entered the medical department of the British navy, where he served for many years and in various parts of the world. For five continuous years he was with the party that searched for Sir John Franklin in the Arctic regions; and with this party he discovered the Northwest Passage, circumnavigating the American continent. He served in the Russian war of 1855; from 1869 to 1880 he was director-general of the medical department of the navy. Sir Alexander was a fellow of the Royal Society, and in 1871 was created a military K. C. B. He published *A Personal Narrative of the Discovery of the Northwest Passage* (1857) and *Observations on Naval Hygiene*.

ARMY. See **NURSES, TRAINED**; **SMALLPOX**; **VITAL STATISTICS**.

ARMY OF SANTIAGO DE CUBA, SOCIETY OF THE, organized 1898 to preserve the history of the Santiago campaign of the Spanish-American war. President, Major-General W. R. Shafter; secretary, Major A. C. Sharpe, Washington, D. C.

ARTISTS, SOCIETY OF AMERICAN, founded in 1877, in 1899 had 107 members, holds annual exhibitions at its building, 215 West Fifty-seventh Street, New York City. President, John La Farge; secretary, Douglas Volk. In the exhibition of 1899 the Webb prize was awarded to W. L. Lathrop, and the Shaw Fund to Douglas Volk.

ARTS CLUB, NATIONAL, was organized in 1898, for the purpose of showing the art-loving public what has already been accomplished by Americans in the way of decorative arts. Its membership in 1899 numbered 1100. It holds frequent exhibitions. President, George B. Post; secretary, Charles de Kay, 37 West Thirty-fourth Street, New York City.

ART STUDENTS' LEAGUE, formed in 1875, to conduct classes of instruction in painting, drawing, modelling, and composition, had in 1899 a membership of 364 and 960 students. Advisory director, John La Farge; corresponding secretary, Miss Alice M. Simpson, 215 West Fifty-seventh street, New York City.

ASBESTOS. The production for 1898 amounted to 605 short tons, valued at \$10,300. Canada still remains the chief source of supply. The domestic product, which is true asbestos, comes mostly from Georgia, but the Canadian asbestos, which is chrysolite, a fibrous variety of serpentine, is considered to be of superior quality.

The Canadian production for 1898 was 23,785 short tons, valued at \$486,227.

ASOENSIION is a small island of volcanic origin, with an area of 35 square miles, and lies in the Atlantic Ocean, about 900 miles west of the mouth of the Congo in Africa, or about midway between the continents of Africa and South America. It is an important naval station of Great Britain and possesses a steam factory, naval and victualling yards, and a coaling depot. The island has recently been strongly fortified, and is under the British Board of Admiralty, by whom a naval officer is appointed as captain in charge, the present officer being Captain G. N. A. Pollard, R.N. The garrison station is Georgetown on the northeast coast.

ASOROFF, ROBERT, member of Parliament, was born in 1847; died June 19, 1899. He was educated at the Royal Grammar School, Lancaster, England, and in 1869 was admitted to the bar. He was an active participant in the discussion of various questions of capital and labor and settled many business causes in Lancaster. He became president of the Oldham Law Association, and from 1895 to the time of his death represented Oldham in Parliament, as a Liberal.

ASHANTI. See **GOLD COAST**.

ASIA. The purpose of the present article is to give a brief sketch of some of the striking features of the opening up of Asia to Europeans, and to show how far the partition of Asiatic territory among western nations has been carried. Details in regard to the different countries, especially as to their condition and their history in 1899, will be more appropriately treated in the articles on the countries themselves.

Partition of Asia.—The following table gives the estimates of the area and population of the Asiatic territories of the chief European sharers:

		Area in Sq. Miles.	Population.
Russia in Asia.	Northern Caucasia	89,497 (1897)	3,786,784
	Trans-Caucasia	91,346 "	5,461,911
	Caucasus	180,843 "	9,248,695
	The Steppes	908,073 "	3,451,385
	Turkistan	257,184 "	3,696,106
	Trans-Caspian	214,237 "	372,193
	Western Siberia	870,818 "	3,367,576
	Eastern Siberia	3,044,512 "	1,992,221
	Amur Region	880,830 "	339,127
	Sakhalin	29,336 "	28,166
	Dependencies { Bokhara	92,000 "	2,500,000
	{ Khiva	22,320 "	700,000
British Asia.	India and Dependencies	1,559,603 (1891)	287,123,350
	Aden and Perim	80 "	41,910
	Somali Coast	68,000 "	
	Bahrein Islands		
	British North Borneo	31,106 "	175,000
	Brunei	3,000 "	
	Sarawak	50,000 "	
	Ceylon	25,383 (1897)	3,391,443
	Hong Kong	29 (1898)	248,710
	Baluchistan	130,000 (1891)	500,000
	Sikkim	2,818 "	30,458
	Great Andamans	1,760 "	
	Little Andamans		
	Nicobar Islands	684 "	6,915
French Asia.	Laccadive Islands		14,440
	Labuan	30 1/2 "	5,853
	Straits Settlements	32,933 "	930,869
	India	197 (1895)	296,910
	Anam	81,000 "	6,000,000
Portu- guese Asia.	Cambodia	46,000 "	1,500,000
	Cochin-China	22,950 (1897)	2,035,000
	Tonquin (with Laos)	135,000 "	12,000,000
	India (Goa)	1,390 (1887)	494,836
	" (Damão, Diu)	168 "	77,454
	Indian Archipelago	7,458 "	300,000
	China (Macao, etc.)	4 (1886)	78,627

Russia in Asia.—The greater part of the Russian dominions in Asia has been acquired as the result of a gradual and hardly conscious expansion extending over several centuries. The Russians are fond of saying that Russia is at home in Asia, and they point to this fact as accounting for the rapid and complete assimilation of the natives to their rule. The acquisition of Siberia, for instance, came more from the private initiative of the subject than from any conscious policy on the part of the government. Great blocks of territory were thus involuntarily acquired by the czars, and in this movement the enterprise and courage of the Cossacks played a most important part. It is only of late years that eastward expansion has been carried on in accord with definite principles of governmental policy. The controlling motive in the earlier movement, so far as there was a definite motive, was the desire to gain free access to the ocean and to strengthen the southwestern borders of Russia against the nomadic tribes. Opposition was encountered in only two quarters—namely, the extension of the southwestern boundary of Siberia toward Central Asia and the establishment of Russian power on the Amur. Both these objects have been accomplished in the present century. Turkistan in Central Asia has been conquered by Russia, which has brought under its sway the Khanates of Khiva, Bokhara, and Kokan, and, in 1850, Admiral Nevelsky hoisted the Russian flag at the mouth of the Amur. Shortly afterward Russia acquired all the left bank of the Amur, and in 1860 the region of its tributary, the Usuri River. Finally, the whole territory extending from the sea of Okhotsk and from Corea and Manchuria came into Russia's possession, laying the basis of the great power which to-day threatens the northern frontier of China. Russia points to the peaceful character of this expansion as a sign of the humane spirit of the advancing race and of its natural sympathy with and understanding of the subject peoples. The

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chief object of this movement during the present century appears to have been the need of an outlet on the open sea. To this end the policy of Russian monarchs, from the time of Ivan the Terrible to the present day, has, from time to time, been directed and it is this which has brought Russia to Port Arthur on the Chinese coast. What seems to other nations a sign of aggression and greed on the part of Russia is justified by her writers by the argument of manifest destiny and by an appeal to the natural justice of Russia's claim to be the civilizing agent for the less advanced populations of the east. They disclaim all intention of partitioning Asia, but they evidently believe that sheer force of circumstances will carry Russia's dominions in Asia farther as time goes on. In point of mineral wealth and other natural resources Russia's Asiatic possessions surpass those of any other European power. Siberia has already advanced to an extraordinary degree in trade and industry and further developments are certain. The Russian prestige among the native population is greater than that of other European powers, and it is attributed by Russian writers not to mere conquest and brute force, but to the natural sympathy between them and the natives. Russia's influence in Central Asia is increasing as well as on the eastern coast. It is paramount at the Persian capital, and northern Persia seems destined to be hers. On the Afghan frontier she has been active for many years, and in the Pamir Mountains, known as the roof of the world, where three great powers meet, she was threatening some years ago to assert her authority. She sent down a military expedition in 1891, and by establishing a permanent military post made them her territory. To the south of the Pamirs lie the range of the Hindu-Kush, dividing the Indian waters from those which flow into Central Asia. Beyond this the British government has declared that there shall be no interference on the part of a foreign power. In 1891 the British, on learning that Russian officers had crossed to the southern side of the range, occupied Hunza and Chitral. Later the limits of their respective territories were defined. By this arrangement British political control extended to the Hindu-Kush range, and is separated from Russian territory by a narrow piece of Afghan land, which is indirectly under the control of the Indian government, so that the territories of the two powers are almost coterminous. For some account of the recent events bearing on Russia's share in China, see the article CHINESE EMPIRE. See also AFGHANISTAN (paragraph Afghan Question).

British Asia.—Besides the vast dominion of India, British power has expanded eastward over Baluchistan to the Persian frontier and along the coast of the Bay of Bengal, over the Straits Settlements. Toward the west the expansion has extended over eastern Arabia, where the dominance of British influence was asserted in 1899 in connection with the Muscat incident. (See FRANCE.) Toward the north the British have extended their control into the Himalayas and annexed several of the hill states in that region. Southwestern Arabia is also under British influence. Among the other great dependencies are Ceylon and Hong-Kong, which have for years been prosperous colonies. North Borneo, which was won for Great Britain years ago by Rajah Brooke, is also a promising colony. Her trade route to her eastern dominions is by way of the Suez Canal in time of peace; the Cape route would be used in time of war, when the Mediterranean would be unsafe for trade on account of exposure to attack from the surrounding coasts. The Cape route has the convenient coaling stations of Sierra Leone, Cape Town, and Mauritius.

French Asia.—The centre of French influence in China is the rich valley of the Mekong River, along whose course lie the following countries in their order from its source: First, the region of Laos; then Anam, which is an empire under French protection; then Cambodia, a protectorate under the administrative control of France; then Cochin-China, spreading out into a marshy plain of fertile land, and finally Tonquin, which, though nominally a protectorate, is directly under French administration. Of these Anam was the first to enter into permanent relations with France, its ruler having concluded a treaty with the latter power toward the close of the eighteenth century, and having conceded to France the bay of Turan and certain commercial advantages in return for aid rendered him in war. The last to come under French control was Tonquin, which is now one of the most valuable of the French possessions. It was won only by dint of hard fighting and great loss of life in repelling the claims of China, which were finally annulled by the treaty of Tien-tsin in 1885. For years after this the country was still in disorder, and it is only at a recent date that an orderly and effective administration was insured. It is estimated that the commerce of Cochin-China and Cambodia rose from 100,000,000 francs in 1888 to 147,000,000 in 1897, and that the commerce for the whole of French India was 205,000,000 francs in 1897, and reached a still higher figure in 1898. But the expense of administering the government has been very heavy, over 20,000,000 francs being annually paid out for military expenses. Repeated troubles with Siam, whose government was accused by the French of en-

croaching on their dependency of Cambodia, led finally to the threatened bombardment of Bangkok in 1893, and in 1896 a treaty with England established the present relations between France and Siam. This treaty neutralized the basin of the Meinam for France and England. Between Burmah and Tonquin the Mekong marks the dividing line between the French and English possessions. Another neutral strip lies in Siamese territory on the right bank of the Mekong, into which the Siamese government has promised not to send armed troops. Between the Mekong and the basin of the Meinam the territory is subject to French influence, and French agents are kept at the principal towns. See **INDO-CHINA**, **CHINA**, and the separate articles on the French possessions.

The relations of the United States with Asiatic politics have been almost exclusively concerned with commercial privileges in China and Japan. An account of their most recent aspects will be found in the article on Chinese Empire.

Railways.—Railway development has been a remarkable feature of the recent progress in Asia. In Asia Minor the Germans are actively engaged in railway extension. A German company has obtained a concession for a new line. The French have already opened a railway extension as far east as Afum Kara Hissar. When the German line is completed it will cover some 2000 miles and unite the Persian Gulf with Europe, opening up a rich agricultural country. This will give Germany the control of the chief markets of Asia Minor. The Constantinople-Ismid line, which has been purchased by German capitalists from an English company, has been extended to Angora. The trade of Smyrna and Constantinople, the chief distributing points of Asia Minor, is thus brought under German control. It is estimated that the railways in all Asia have at present a length of about 30,000 miles, two-thirds of which belong to British India. The parts of the Trans-Caspian and Trans-Siberian lines already constructed have a length of about 3200 miles. It is estimated that European syndicates have obtained concessions for 3600 miles of railways in China, and the Chinese government owns about 300 miles. See the article **CHINESE EMPIRE** (paragraph Railways).

Japan (*q. v.*) has an extensive railway system, the length of which is estimated at 3200 miles. French Indo-China, though having only about 120 miles at present, has in prospect some 2400 miles. There are 1000 miles of railway lines in Java. Railway construction has hitherto been unimportant in Persia, but Russia has taken charge of the Persian railway development, and important projects were formed in 1899.

ASIATIC ASSOCIATION, AMERICAN, organized in 1898 for the purpose of fostering commercial relations between the United States and the East, had in 1899 a membership of 205. President, Everett Frazer; secretary, John Foord, P. O. Box 1500, New York City. See **CHINA**.

ASIATIC SOCIETY OF BENGAL founded in 1784 in London, has an Indian Museum, and publishes *Bibliotheca Indica*, a series of volumes of Oriental literature.

ASPHALT. See **PAVEMENTS**.

ASPHALTUM. The production of the different varieties of asphaltum in 1898 was as follows:

Variety.	Quantity.	Value.
Crude asphaltum.....	11,300	189,900
Bituminous sandstone.....	43,624	126,831
Bituminous limestone.....	5,502	26,412
Mastic	1,188	17,840
Hard and refined, or gum.....	1,878	53,666
Maltha	12,875	271,000
Total.....	76,367	685,649

It is interesting to know that bituminous rock makes up 65 per cent. of the tonnage, but less than 35 per cent. of the value. Most of it comes from California. Professor W. S. Day has described a new solid asphalt from Utah, which is known as nigrite, on account of its intensely black color. It resembles asphalt in many of its properties, but differs from it in giving a perfectly black streak, while other asphalts, which are black in lump, give a brown streak. It cannot be entirely melted, and the distillations produced are not easily volatile, although two-thirds of the material is volatilized by heating. The general character of the nigrite leads us to believe that it was formed by distillation—that is, by the passage of steam through a rock. This deprived it of the most volatile constituents, while the subsequent direct heating of the residue converted it into nigrite as found. Much attention is now being paid to the asphaltum deposits of Indian Territory, which, Taff states, occur near McAllister as stringers in veins, filling fissures along lines of faulting. Liquid asphaltum is reported to have been discovered in the vicinity of Higginsville, Mo.

and massive asphaltum from Montana. The imports of asphaltum during 1898 amounted to \$260,765, and were obtained from the West Indies, Switzerland, Italy, Venezuela, Germany, France, Mexico, Turkey in Asia, Great Britain, United States of Colombia, and Canada.

ASPIROZ, MANUEL, who succeeded Señor Matías Romero as Mexican ambassador to the United States, was born in Pueblo, June 9, 1836. He was graduated from the University of Mexico, studied law and attained distinction. He served in the war against the French, and won promotions and medals, and, after the republican government had been established, he became assistant secretary for foreign affairs (1867). In 1872 he came to Washington as agent for his government before the Mixed Claims Commission. In 1873 he became Mexican consul at San Francisco. Subsequently he served in the national senate, and was entrusted with several important matters of diplomacy. From 1883 to 1890 he was professor of Mexican law in the State College of Pueblo, and also acted as secretary of the treasury of that state. In May, 1890, he again became assistant secretary for foreign affairs, and on several occasions the department was under his charge. In his own country Señor Aspiroz is recognized as a man of learning and ability. In 1876 he published *Código de Extranjería de los Estados Unidos Mexicanos*.

ASSEMBLY, GENERAL, The officers of the General Assembly of the Presbyterian Church (North) are: Moderator, Rev. Robert F. Sample, D.D., New York City; stated clerk, W. H. Roberts, D.D., LL.D., 1319 Walnut Street, Philadelphia, Penn.; president of trustees, George Junkin, Esq., Philadelphia; treasurer, F. K. Hipple, Esq., Philadelphia; corresponding secretary, Edward B. Hodge, D.D., 1319 Walnut Street, Philadelphia, Penn.

The officers of the Presbyterian Church (South) are: Moderator, J. F. Cannon, D.D., St. Louis, Mo.; stated clerk, W. A. Alexander, D.D., Clarksville, Tenn.; permanent clerk, Robert P. Farris, D.D., St. Louis, Mo.; president of trustees, E. Nye Hutchinson, Charlotte, N. C.; secretary and treasurer, John R. Farr, Esq., Charlotte, N. C.

ASSOCIATE REFORMED SYNOD OF THE SOUTH (Presbyterian) had in 1899, 9 presbyteries, 104 ministers, 130 congregations, and 10,364 communicants. A great loss was sustained in 1899 in the death of the Rev. Dr. W. M. Grier, president of Erskine College.

ASTEROIDS. See ASTRONOMICAL PROGRESS.

ASTEROL. A new antiseptic, a soluble preparation of sulfocarbolate of mercury, has been devised. It contains 17 per cent. of mercury, thus being about one-quarter as strong as bichloride of mercury. Asterol is soluble in water, forming a permanently clear solution; it is markedly bactericidal, and it is not precipitated by albumen; it is not cauterant, though deeply penetrating, and it does not attack instruments.

ASTRONOMICAL AND ASTROPHYSICAL SOCIETY. See ASTRONOMICAL PROGRESS.

ASTRONOMICAL PROGRESS DURING THE YEAR 1899.—The year 1899 was fully up to the average in the number and importance of new discoveries and researches. Those of special interest are described briefly in the following pages, omitting technicalities as far as possible.

Ancient Astronomical and Meteorological Documents.—Professor Hellman, of Berlin, has prepared a volume of reproductions from certain rare meteorological and astronomical documents dating from the fifteenth and sixteenth centuries. Bearing upon astronomy principally from the historical side, these documents are of special interest as showing how very old are many of the signs and superstitions still surviving in our common almanacs of the present day. There are in all twenty-three reproductions in fac-simile of old publications, dealing principally with weather predictions and with accounts of remarkable observed phenomena. Sixteen of these are of German origin, three French, three Italian, one Spanish, one English, one Dutch, and one Danish.

The English document is entitled *An Almanacke and Prognostication made for the yeare of Our Lorde God M.C.LV made by Maister Anthony Askham Phisician and Preste*. Here we are told that medical remedies, "preparatiues for digestion," will be most effective if taken when the moon is in certain signs of the zodiac. This survives in the almanacs of to-day. Thus the *Farmer's Almanac* of New England still gives for each day of the year the name of the zodiacal sign in which the moon happens to stand. This information is for no other purpose than to aid in medical treatment. Medicine to cure the headache, for instance, must be used when the moon is in Aries, etc., etc. We have seen very recent almanacs in which a definite statement to this effect was duly printed in modern type and language. The old English almanac under discussion also says that when the moon

is in "Aquarins or Pysces" we may "cut heyres." Weather predictions are given in precisely the same ridiculous form as we still find in some of our modern almanacs. "Many hayle showers and cold a day or ii," says this old almanac of 1655 in nearly the same language as that used to-day. There are still many persons who cannot be persuaded that changes in the weather do not follow as a necessary consequence of changes in the moon's quarters, notwithstanding the fact that the lunar phase changes every day in the year just as much as it does at the quarters and at new and full moon. Doubtless the genuine astronomical predictions of our almanacs, such as eclipses of the sun and moon, dates of full and new moon, times of sunrise, etc., lend an air of reliability to the hodge-podge of unnecessary or incorrect meteorological material.

Theory of Ocean Tides.—Tidal theory offers one of the most intricate problems known to mathematical science. It has received the attention of many of the best mathematicians, and cannot be said even yet to have been solved in a thoroughly satisfactory manner. And aside from the purely theoretical treatment, it is not too much to say that we possessed no good non-mathematical presentation of the theory in a form easily understood until the recent appearance of Darwin's book on the subject (*The Tides*, by George Howard Darwin). Himself a distinguished contributor to the mathematical literature of the tides, Darwin has approached the task of explaining them in popular language, equipped with a more intimate knowledge than that possessed by any other writer. And notwithstanding the intricate nature of the whole matter, he has really succeeded at last in giving us a simple explanation easily understood by any one. The importance of such a presentation cannot be overestimated; it is indeed no mean contribution to pure theory itself.

The reader will recall the usual explanation of the text-books on astronomy. Tides are caused by the gravitational attraction or pull of the sun and moon upon the water, and upon the earth itself. The moon being so much nearer than the sun, is of course, the principal cause. When the moon is directly over a given place it pulls the water under it, and thus tends to heap up a tidal wave just under the moon. At the same time it is pulling the earth itself; but it pulls the water more than the earth underneath, simply because the moon is nearer to water on the surface than it is to the solid earth behind it. For we must remember that, according to Newton's law of attraction, the pull decreases rapidly when the body pulled is removed to a greater distance. But this reason also makes the attraction exerted upon the solid earth greater than that affecting the mass of water upon the side of the earth opposite to the moon. This water being still farther away than is the solid earth, gets the least pull of all. The earth is, so to speak, pulled away from that part of the ocean that is opposite the moon, instead of directly under it. This causes another distinct heaping up of water opposite the moon, giving us a second tidal wave. There should be, therefore, two lunar tidal wave crests, one directly under the moon, and the other on the side of the earth opposite the moon. This explanation is modified somewhat on account of the attraction of the sun, which at times tends to increase, and again at times to diminish, the lunar tide. We thus get the high tides of full moon and the low tides of certain other ages of the moon. And the double tidal wave explains why there are two high tides and two low tides every twenty-four hours. This explanation is called the "equilibrium" theory of the tides. It is very plausible, but unfortunately it fails to agree with observed facts, though it is nevertheless of great use in leading up to a better theory. Under the equilibrium theory we should expect high water at any place about the time when the moon, as astronomers say, passes the meridian. This time might be modified by the solar effects, but only to a rather small amount easily calculated. Unfortunately, this is not in accord with observation. There are places where the high water comes as much as six hours away from the meridian passage of the moon. In other words, the equilibrium theory is at times in error by the maximum possible amount. The trouble is that it tells us what would happen if the forces governing the tides had plenty of time to act. But the turning of the earth on its axis continually presents a new meridian to the moon, so that the tidal wave crest is always following the moon, ever trying to be highest directly under it. Thus what should occur under the equilibrium theory is greatly modified by the theory of the motion of fluid waves. This leads them to the "dynamical" theory of the tides, which Darwin presents with really remarkable lucidity.

A consideration of the subject is much simplified by assuming a condition of things that does not really exist in nature. Let us imagine a canal full of water encircling the earth at the equator. Sir Isaac Newton was the first to investigate what would happen to a wave set in motion in such a canal. It can be shown mathematically that the speed at which such a wave would travel depends simply on the depth of the canal. The deeper the canal, the greater the speed of the wave. This is, of course, very important, and shows what a perfectly free wave would do under such simplified conditions. It can even be computed that if the canal

were $13\frac{3}{4}$ miles deep, the wave would travel round the earth in exactly twenty-four hours. Now, it is the tendency of the sun and moon to set such a free wave in motion at each instant of time; and these go on travelling along more or less like the supposed simple wave in the canal. If the ocean were $13\frac{3}{4}$ miles deep, the waves would have a period of one day; and the new free waves forming all the time would reinforce the old ones, leading to an enormous tidal accumulation. Fortunately, the ocean is much less than $13\frac{3}{4}$ miles deep, and the waves travel much more slowly than once a day. It may happen, therefore, that as the waves travel around the earth, their speed may be such that we shall find a wave hollow instead of a wave crest under the moon. Thus the modification of the equilibrium theory by the wave motion may at times completely reverse things, giving us low tide when we should expect high tide.

We may carry the canal idea a step farther, with a remarkably interesting result. Suppose the whole surface of the earth were covered with a series of canals parallel to the equatorial canal. Then, as we approach the pole, the canals will be shorter, since the equatorial circumference of the earth is longer than it is in any other latitude. Thus the waves in high latitudes would not have so far to go as the waves in low latitudes, and so might tend to reinforce each other as explained above. So we might have "inverted" tides in the equatorial regions and direct ones in the polar regions; and in some intermediate latitude there would be, as Darwin says, "very great tides, the nature of which cannot be specified exactly." This would occur, as we have seen, where the earth's circumference is short enough to permit a free wave to go all around in about twenty-four hours. These dynamical considerations of wave motion in canals lead to results bearing some sort of resemblance to the actual observed phenomena of nature. But interesting as it is, we cannot here pursue the subject farther from a theoretical standpoint.

Fortunately, the practical prediction of the time of high water for any place can be effected with quite high precision, and almost without using any theoretical considerations whatever. It is merely necessary to analyze by certain known methods a very long series of tidal observations made at the place in question, in order to arrive at a more or less empirical law by means of which future high tides can be predicted for that place. This method of procedure has been in use for many years, and we now possess tidal tables for all principal seaports quite accurate enough for the purposes of navigation.

In addition to his lucid and novel treatment of the subject of ocean tides, Darwin has also dealt with a number of interesting phenomena hardly, if at all, treated by other investigators. The subject of "cosmic" tides is well explained. These cosmic tides are the immense tidal effects that we must imagine were set up in the planetary systems while still in a semi-plastic condition during the process of evolution. Such a system is that formed by our earth and moon. It would lead us too far afield to do more than touch very briefly indeed upon these matters. But Darwin has shown that the moon probably once was a part of the earth, and that cosmic tidal effects might readily account for its being detached in some very early and plastic stage of the earth's development. Terrestrial variation of latitudes, Saturn's rings, and numerous other phenomena coming more or less closely within the range of tidal theory, also find a place among Darwin's profound researches.

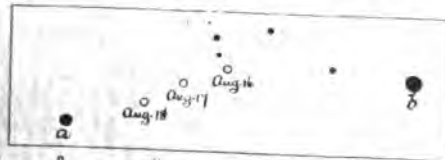
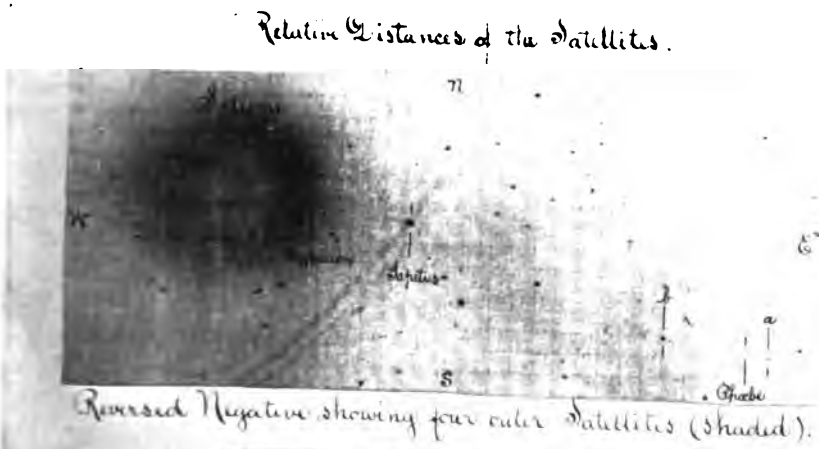
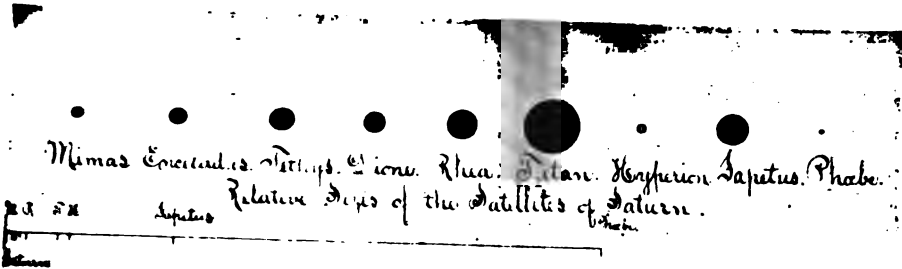
The November Meteors.—The meteor shower which was expected for November of this year received much attention both from astronomers and from the public at large. The newspapers in particular exploited it extensively, and in a manner more or less sensational. It seems as though their object was to awaken great popular enthusiasm and create a demand for meteor news which they would then, of course, be ready to supply. So there was a sort of retributive justice in the fact that the meteors were not actually observed to any great extent, and the newspaper hubbub ended with extreme suddenness. We doubt whether any reputable astronomer placed himself on record as predicting with certainty the arrival of this meteor group. And while we cannot too often emphasize that mathematical calculations do not lie, provided only they are the work of careful and competent authorities, we find the public insisting upon giving full credence to the statements of careless and incompetent persons. But since there has been so much meteor discussion of late, a very brief statement concerning the November shower may be of interest. In the first place, the meteors themselves are simply mineral fragments, probably usually quite minute, and travelling through space in orbits not unlike planets or comets. They are not themselves luminous, and we see them only when they happen to dash into our terrestrial atmosphere. Friction of the meteors against the air then heats them, until they become first red-hot, and then incandescent or luminous, like any other burning substance. When the heat is finally sufficient to transform part of the melted meteoric mass into hot, luminous vapor, this will stream out behind the flying particle itself, giving us the characteristic meteor trail. This trail (popularly called a shooting star) is a startling object in the stillness

of the night. It is easy to understand that if the number of these trails should be very great, running up perhaps into the hundreds every minute, we would have one of the most impressive and beautiful sights in all nature. Now, this is precisely what happened in 1799, 1833, and 1866; so there was certainly some excuse for the extraordinary newspaper interest in the expected shower of 1899.

This particular great bunch of meteoric particles, called the Leonids, is moving around the sun in an elliptic orbit, completing an entire circuit once in about thirty-three years. The orbit or path intersects that of the earth, and it is possible for the meteors and the earth to occupy occasionally the same point in space. But we can see the meteors only if they come near enough to penetrate actually into our own atmosphere. Therefore, they cannot become visible unless meteors and earth are at that particular intersection of the two paths at one and the same time. If either is early or late at the meeting-place, we cannot see the swarm. This, apparently, is just what has happened this year, and so only a few stragglers or forerunners of the main body of meteors were actually seen. The question is therefore now often asked: "How did the astronomers come to make such a mistake?" The answer is, that there was no mistake. It is not within the power of science to accomplish the impossible. Astronomical calculations concerning meteors cannot be predictions of definite certainty. The most we can do is to state the likeliest time for the phenomenon to become visible, always adding that this time may be in error by a considerable amount, and that quite possibly a visible meeting of earth and meteors will not take place at all. Our predictions result from calculations based ultimately upon previously observed data; and there is much difficulty in observing meteors exactly. Each individual meteor is visible for so short a time that it is quite impossible for the observer to record its position with great accuracy. Here again, as in so many departments of observational astronomy, we have much to expect from photographic processes of observation. For the meteors, when they become luminous, quite readily impress the sensitive surface of a photographic plate, and thus leave a permanent record admitting of subsequent leisurely and accurate measurement. But unfortunately, there has been no great shower of Leonids since the introduction of photographic methods. In 1866, when they last appeared, astronomers were just beginning to use the camera, and no arrangements for photographic work were made. This is the reason for the elaborate preparations to photograph the expected shower of 1899. Astronomers were by no means sure that the event would occur at the predicted time, but they were quite certain that no precautions should be neglected which might bring about successful observations in case the shower should occur and the weather prove favorable. To guard against the chance of bad weather, numerous photographic observing stations were established so as to cover a wide extent of territory; and to prevent failure arising in case the shower should happen during daylight, a well-equipped expedition was despatched to India, where, of course, it would be night during the hours of daylight in America.

A New Satellite of Saturn.—It begins to seem as though there were no limit to the range of astronomical possibilities opened up by the application of photographic processes of observation. Certainly we must characterize as one of the most brilliant discoveries of the year, W. H. Pickering's remarkable photographic observations, which have added a new member to the group of satellites circling the ringed planet Saturn. It will be remembered that the Harvard College Observatory was enabled to construct a new and large photographic telescope a few years ago. The cost of this instrument was defrayed at the time by Miss Bruce, of New York City, and it has since been known as the Bruce telescope. It was finally mounted at the branch observatory maintained by Harvard at Arequipa, in South America. Here numerous photographs of the region surrounding Saturn have been made from time to time by Dr. Stewart. A careful examination of these by W. H. Pickering revealed the new member of the solar system. The discovery was announced by E. C. Pickering, director of the Harvard College Observatory, in a printed circular dated April 10, 1899.

The manner in which the discovery was made by Pickering is very interesting. He superimposed two negatives made August 16 and 18, 1898. Of course, all the star-images on the two photographs corresponded exactly. Every star-image on the one plate was covered by a star-image on the other. But it was very different with the satellite. For in the interval of two days between the dates of the photographs, this small body had moved a little in the course of its orbital revolution about the planet Saturn. Consequently, as Pickering says, "a faint object was found which appeared in different positions on the two plates." This established beyond a doubt that we have to deal with something other than a star. It must, therefore, be either an asteroid, a satellite of Saturn, or some unknown planet exterior to Saturn. The possibility of its being an asteroid is negatived at once; for the photographs show its rate of motion among the stars to be less than that of Saturn, so that it is cer-



Approximate Data.

Name	Discovered	Date	Distance	Period	Mean Diameter
Phoebe	W. H. Pickering	March 14, 1899	8000000	17 months	155 200 miles

Phoebe, the new Satellite of Saturn.

PHOTOGRAPHS ILLUSTRATING THE NEW SATELLITE OF SATURN.
 (Reproduced by courtesy of E. C. Pickering, Director of the Harvard College Observatory.)

tainly farther away from the sun. For the nearer a planet is to the sun, the more rapid is its apparent motion. So it cannot belong to the group of asteroids which are all within the orbit of Jupiter, and very far within that of Saturn. There remains the hypothesis of a possible exterior planet. From the evidence at present in hand, we cannot yet decide with absolute certainty the true nature of the new body. But we can at least say that the close proximity of Saturn renders it extremely probable that we have to do with a satellite. That a new exterior planet should be found so near to Saturn on the sky is, indeed, possible, but improbable in a very high degree. This question will, of course, be set definitely at rest as soon as we can dispose of some further photographic observations. Visually, the new object has not yet been discovered. Assuming, then, that we have to do with a true satellite of Saturn, we can summarize very briefly the information so far obtained. The plates at our disposition are four in number—two made August 16, and one each August 17 and 18, 1898. Thus, while there are four plates, there are but three dates of observation, and these separated by an interval of one day only. This is but meagre material upon which to found a study of the satellite's orbit. But there can be no doubt that ample observations will soon be available, for a number of additional photographs have been made with the Bruce telescope, and will soon be fully measured and discussed. So much we know, however. The new satellite is so far from Saturn that the attraction of the latter upon it can be but little greater than that of the sun. The orbit will doubtless turn out to be a very elongated ellipse. It is interesting to note that the last discovery of a satellite of Saturn was also made at the Harvard College Observatory. It occurred in September, 1848, when William C. Bond discovered Hyperion. The new satellite has received the name Phœbe.

Woman's Work in Astronomy.—Miss Dorothea Klumpke, of the observatory in Paris, France, has published (*Bull. de la Société Astronomique de France*, April, 1899) a very complete article on the contributions of women to astronomical science. The subject is interesting at the present time, when women are beginning to enter more and more into professions and pursuits formerly considered open to men only. The historical part of Miss Klumpke's investigation outlines briefly the work done by the well-known scientific women of ancient and modern times. The efforts of Caroline Herschel, Mary Somerville, and Sonya Kovalevski have certainly been rewarded by no small measure of success, and, in earlier times, such women as Hypatia and Maria Agnesi have placed their names upon the roll of distinguished mathematicians and astronomers. Yet it has been questioned with some show of reason whether these women were not famous rather because they were scientific women than because they produced really original and valuable contributions to exact science. That a woman should devote herself to very abstruse studies is so uncommon that it attracts attention for that reason alone. However that may be, Miss Klumpke has certainly established one important point. The modern development of photographic astronomy has really opened a genuine new profession to woman. The older forms of observational astronomy offered her but rarely an opportunity for a successful career. The necessity for prolonged observation at night and the consequent exposure to the rigors of winter weather have been among the difficulties in the way. But the photographic method in astronomy has changed all the conditions of observing. Measurement of photographic plates with the microscope has replaced direct telescopic scrutiny of the sky. Daylight observation has been substituted for night work. A comfortable chair in a well-warmed and lighted astronomical laboratory is now used, while formerly the observer sat in a constrained position upon an observing chair more or less closely resembling a ladder. Moreover, photographic measurement requires painstaking care, neatness, and industry, rather than originality of mind and physical endurance. It is therefore particularly adapted for women, and they have not been slow to take it up. As Miss Klumpke points out, quite a large number of important observatories now have laboratories for the measurement of celestial photographs, and in most of these the work is done by women. Among the number are Paris, Greenwich, Oxford, St. Petersburg, Helsingfors, Cambridge, U. S., New York, Cape Town (South Africa), and many others. Probably more than a hundred women are now working as professional astronomers in this way. There can be no doubt that the number will go on increasing steadily, so that we have really not gone too far in saying that photographic astronomy has given a new profession to woman.

A New Fundamental Catalogue of Stars.—One of the most important uses of astronomy for the practical purposes of every-day life arises in connection with the navigation of ships across the ocean. Every one knows nowadays that navigators find their way by means of sextant observations of the sun or stars. Probably fewer persons, however, are aware that such observations do not furnish the position of the ship directly, but that they must first be subjected to a process of calculation or reduction in order to obtain the ship's latitude and longitude. In

making these calculations, the navigator requires certain astronomical data which vary from day to day throughout the year, and which are not even the same for the same date in different years. These data can be computed in advance by astronomers and tabulated for navigator's use. Such a tabulation of astronomical data is called a "Nautical Almanac." The preparation and printing of such almanacs is very costly, yet it is a work of public necessity, and is therefore properly carried out at national expense. The governments of England, France, Germany, and the United States each maintain an office for the preparation of nautical almanacs, and for their publication two or three years in advance of the time when they will be needed by navigators.

In the computations made in this way at the nautical almanac offices, certain fundamental astronomical tables and constant quantities have to be used. Such are, for instance, tables of the planetary motions about the sun in accordance with the Newtonian law of gravitation. Among the astronomical constants we may mention the distance from the earth to the sun, or "solar parallax," the velocity of the propagation of light through space, etc. Among all this fundamental material of computation, one of the most important and prominent necessities is a catalogue giving the exact positions on the sky of the principal fixed stars. Of course, the greatest efforts are continually being made to improve the exactness of the data used in preparing the nautical almanacs, so as to make the latter also come as near as possible to perfect precision.

In the early part of the year 1896 the directors of the four national almanacs mentioned above met in Paris to confer upon the best methods to be pursued in order to reach the desired results in the most expeditious and economical way. It is not too much to say that this Paris conference of 1896 marks a distinct epoch in the progress of astronomy. For the nautical almanacs are not intended solely for the comparatively rough purposes of the navigator. They contain also certain materials that are used in the reduction or computation of all astronomical observations of precision, and thus exercise an influence of no small import upon the progress of the science as a whole. This conference was attended by Newcomb and Backlund, representing the United States; Bauschinger, representing Germany; Downing and Gill, representing Great Britain; Faye, Loewy, and Tisserand, representing France. Each country was thus represented by the director of its nautical almanac, and in some cases by one or two other specialists. The principal results of the conference may be summarized as follows:

1. An agreement was reached as to the values to be employed in all the almanac computations for the fundamental astronomical constant quantities.
2. It was arranged to avoid unnecessary duplication of computations by interchanging certain calculations between the several offices.
3. The preparation of a new standard star catalogue was decided upon, to serve as a basis of work for all the almanacs.

The first of these three resolutions is perhaps the most important of all. We cannot too often emphasize the fact that all astronomical knowledge, based as it is ultimately upon the fallible human senses of observation, can never be perfectly exact. We approach as near as we can to the truth, but never quite reach it. Now, under the force of this first resolution, whatever may be the small and unknown errors of our fundamental astronomical data of computation, their effects will henceforth be uniform in all the almanacs. Thus, so far as these almanacs are made the basis for the calculation of all other astronomical observations, the results will be affected with just the same errors. Uniformity in the observations of different countries will replace the present state of comparative confusion. Then, in the future, whenever science shall advance our knowledge of the fundamental data a step nearer the goal of perfect truth, all series of observations will be found to require just the same corrections. The application of these corrections will then become a very simple matter. There can be no doubt but that astronomers of coming generations will have abundant reason to be grateful to the conference of 1896.

The second resolution of the conference is obviously desirable on the score of economy. We pass at once, therefore, to the third resolution, relating to the star catalogue. We shall not enter into technical details, but simply say that the delicate task of preparing such a catalogue as is needed was entrusted to Newcomb, of Washington, by unanimous vote of his colleagues at the conference. The resulting catalogue has just been published (*Catalogue of Fundamental Stars for 1875 and 1900, Reduced to an Absolute System*, by Simon Newcomb. *Astronomical Papers Prepared for the Use of the American Ephemeris and Nautical Almanac*, Vol. VIII., Part II.). The magnitude of this undertaking will be well understood when we remember that it involves the discussion and combination of all existing star observations made since the time of Bradley, about the middle of the eighteenth century. That the task would be skilfully and effectively accomplished by Newcomb was so certain in advance, that it seems almost superfluous to say that the

publication of his catalogue is to be counted among the specially important advances of astronomy during the year 1899.

The Astrophotographic Star Catalogue.—This great undertaking involves the co-operation of no less than eighteen observatories and aims at the cataloguing of some two million stars. Star catalogues may be said to be of two kinds: Those which aim at extreme precision, and those attempting completeness as to the number of stars entered in the list. In the former, the great labor involved for each star makes it essential to limit strictly the number of stars. If this were not done, it would be difficult to bring the work within the possibilities of human effort. On the other hand, we may diminish a little the rigid precision with which we obtain and discuss the observational material for each star, and in that case we can attempt greater completeness as to numbers. It is just here that the photographic method is most promising; for it will enable us to be certain of getting into our catalogue every star within the desired limits of magnitude, yet the diminution of precision will not be much, considering the comparatively small quantity of labor involved in the use of photographic methods.

As an example of the extreme "catalogue of precision" we may take Newcomb's work, prepared for the use of the nautical almanac offices, and described in another part of the present article. This kind of catalogue might be likened to a biographical dictionary, in which only important names find a place, but in which all discoverable information is given for each entry. The other kind of catalogue is more like a city directory, which aims at including the name of every resident, but furnishes very little further information.

While we have mentioned that two million stars may be expected to find a place in the photographic catalogue, this must, of course, be taken as a rough advance estimate. The real number will not become known until the final measurement of all plates shall have been completed under the microscope. Yet it is of the greatest interest from several points of view to know just how many stars there are of the several degrees of lucidity. Thus, for instance, a knowledge of the relative number of stars of each magnitude would throw much light upon certain theories as to the distribution of matter in the universe. We therefore welcome as very interesting some definitive figures published by the observatory of Greenwich, England. They have there measured completely all the plates between the declinations 64° and 70° of the northern hemisphere, so that information as to this quite wide zone is now available. The total number of stars measured within these two limits is 58,170. The corresponding number in the great co-operative star catalogue, which has been in process of publication by the *Astronomische Gesellschaft* during the last thirty years is only 4966. Yet this latter is the only catalogue of any accuracy which even approximates in numbers to the photographic work, and the star-positions obtained from the photographs are doubtless more accurate than those of the *Astronomische Gesellschaft* catalogue. Even the Bonn "Durchmusterung," which is a mere inventory of the stars, giving only approximate positions without pretensions to close accuracy, has only 9971 stars in the zone under discussion. Thus we may say that the new catalogue, for this part of the Greenwich zone, has twelve times as many stars as the *Astronomische Gesellschaft* catalogue, and six times as many as the Bonn *Durchmusterung*. More eloquent testimony in favor of photographic processes in astronomy it would not be easy to imagine.

At Potsdam, Germany, another of the observatories participating in this work, they have proceeded far enough to publish this year the first instalment of their part of the catalogue. This is, indeed, the first portion to be issued in definitive form, and is therefore especially noteworthy. The Greenwich results mentioned above are derived from a preliminary statistical communication, no portion of the Greenwich part of the catalogue having appeared as yet. The Potsdam volume gives the measures of 57 plates containing 20,627 stars. It merits somewhat detailed attention here, because, as we have said, it is actually the first volume of a stately row of volumes which will some day constitute a catalogue of stars really worthy of the present state of astronomy. The Potsdam astronomers have evidently been limited somewhat by lack of sufficient funds to carry the work to completion in just the form that would have suited them best. It is plain that the first step in dealing with astronomical photographs must consist in measuring upon the plate the exact positions relatively to each other of the many little black dots representing each a lucid star in the sky. This series of measurements furnishes what astronomers call the "rectangular co-ordinates" of the stars on the plates. These are then the fundamental or raw material for further treatment. The original measures so obtained do not represent quite correctly the actual positions of the stars on the sky, for the photographs are distorted somewhat by the effects of the refraction of light in the terrestrial atmosphere. A ray of star-light, when it impinges on our atmosphere, is bent a little out of its straight course. Just so, when we submerge part of a straight stick in a pool of still water, the stick seems to be bent at the water's sur-

face. This is due to a "refraction," or bending of the light coming to us from the stick under water. The bending always takes place when light passes from one medium into another; and passing from the nothingness of outer space into our air is much like passing from air into water. We do not even find that all the stars have their light refracted by just the same amount, for the refraction depends on several elements that differ for different stars on a plate. We pass over, as somewhat too technical, the details of this matter of refraction, and also the effects of aberration of light, and all the other causes which may make the raw measures on the plate differ from the sky above us. Suffice it to say that methods are known to astronomers by means of which these effects can be eliminated by a process of calculation. Thus the original measures can be transformed into what they would have been if there were no such things as refraction, etc. Still further computations then enable the astronomer to obtain from these measures corrected for refraction, etc., the final positions of the stars on the sky, in just the same form as they would have if derived by the older processes of direct observation instead of photography.

As may be imagined readily enough, all these calculations are extremely tedious and lengthy when carried out rigorously and with exact attention to every detail. They can, however, be much abbreviated if we are willing to sacrifice a little of the last degree of precision in the final catalogue results. Now the Potsdam astronomers have been confronted with the absolute necessity of economizing somewhere in their work, and they have decided wisely that such economy as was necessary should be exercised in the processes of calculation rather than in the actual measurement of the negatives. Thus the original measures, as printed in the Potsdam volume, are as exact as it is possible to make them by the most careful efforts. On the other hand, in computing the catalogue places from the measures, only approximate methods have been used. The Potsdam section of the photographic catalogue will therefore belong to the class of catalogues complete as to numbers, but giving only approximate positions for the stars. There is, however, this important difference from other catalogues of this class, such as the Bonn "Durchmusterung." In the Potsdam work it will always be easy, by the aid of the very accurate original measures, to recalculate the catalogue more closely; or we can even make such calculations for stars that may at any time become especially important. Thus, they have minimized the loss resulting from the necessary curtailment of the Potsdam part of the work. That such curtailment is not altogether unreasonable is easily understood when we remember that even on the present scale, the Potsdam zone will fill twenty quarto volumes, of which the one already issued is but the first.

The Pole Star.—Campbell, of the Lick observatory, has made some very novel observations of the pole star. He finds that it is in reality a very close binary, having a period of revolution occupying about four days, and an orbit probably comparable in size with that of the moon around the earth. There is also considerable evidence that the close double does not constitute the whole of this stellar system. There may be another more distant component, whose effects on the "four-day system" have not yet been fully elucidated.

A Possible Neighbor in Stellar Space.—It has been known from the earliest ages that the fixed stars are in general excessively remote. Nevertheless, astronomers have always cherished a hope that some one star might perhaps be immeasurably nearer to us than the great mass of its companions. Profound as are undoubtedly the outer depths of space, there may yet perhaps exist one other sun swinging through those depths a close companion to our own. It is the hope of finding such a neighboring sun that has led mankind to devote so much diligent effort to the study of stellar distances. It cannot yet be said that this effort has been altogether successful. We have found no "neighbor in space," but we have been rewarded by a whole series of discoveries of scarcely smaller interest. Indeed, it is not too much to say that measurement of stellar distance is essential to a demonstration of the Copernican theory of the universe. This theory supposes the earth to revolve about the sun, instead of occupying an immovable position at the centre of all things. It is therefore obvious that when, in the course of its annual circuit around the sun, the earth is alternately swung far out on one side or the other, there must be a corresponding slight displacement of the apparent directions in which we see the stars. At intervals of six months a star should change its apparent place on the sky a little, moving out from its average position exactly in correspondence with the earth swinging in its orbit. Stellar displacements of this kind are called parallaxic displacements, and to measure them is to determine the star's parallax. It will be seen that the more remote a star is, the smaller will be its parallaxic displacement. Indeed, a star may be so far away that the whole orbit of the earth shrinks into a mere point in comparison. Such a star will have no measurable parallax.

The Copernican theory for centuries suffered from a lack of complete demonstration. No measurable stellar parallaxes could be found. Opponents of the theory

asked: Are we to assume that *all* the stars are immeasurably remote? Indeed, this seemed so unlikely that for a very long time men could not quite believe in Copernicus. It was not until after the middle of this century, when Bessel was able to measure the distance of 61 Cygni beyond a doubt, that this particular objection to the Copernican theory was finally laid at rest. From that time to this, stellar parallax researches have always tended to strengthen our opinion that the stars, while excessively remote, are nevertheless not all immeasurably far away. Stellar systems other than that belonging to our sun have a place within measurable space. Boundless that space may be, but our own little corner, with our own little universe in it, surely has finite limits. We may, therefore, repeat that while the so-called parallax hunters have had no small measure of success, they have not as yet happened on any genuine companion system to our own. We do not know whether our sun, with its attendant planets, is pursuing a solitary way, or whether it forms part of a species of star-stream, having to some extent a common drift through space. There is every reason to believe that such streams exist, a conspicuous example including some of the stars composing the well-known "dipper" in the constellation of the Great Bear.

We have been led to the above considerations by the publication this year of some very interesting parallax researches upon the very same star 61 Cygni to which we have already referred. In the YEAR BOOK for 1898 the peculiar characteristics of this star were described at length. It is remarkable for many other reasons besides the historical one of having been the first to yield to a parallax measurement. It is made up of two component stars, travelling across the sky with nearly the same rate of motion and almost in the same direction. Yet we are not sure it is a true binary, since we have at present no very certain evidence as to gravitational rotation of the two components. Parallax determinations have been numerous since the time of Bessel, but they leave very much in doubt the important question as to whether the two components have equal parallaxes. If not, they are unequally far away from us, and do not belong to one and the same binary system. They must then be themselves sundered by one of those abysmal distances that sometimes stagger the imagination in the study of cosmic astronomy. One other thing is remarkable about this star, something unique, so far as we know. The two components do not retain the same relative positions on the sky. They alternately swing together and again apart. About nineteen months are needed for one such swing back and forth. This peculiarity of motion, which is not a mere orbital revolution, was discovered by Wilsing, of Potsdam, a few years ago, and still awaits confirmation by other observers. In view of all these circumstances, it is not surprising that Schur, of Göttingen, should again take up the parallax problem for this star. He has come upon a result so unexpected that we are compelled to refer to it at some length. But we must first recall briefly the method of studying stellar parallax practically. Suppose a certain star is suspected of having a parallax, or, in other words, of being near enough to allow of measuring its distance. As we have seen, the presence of a measurable parallax shows itself in the form of small displacements of the star on the sky, corresponding to opposite positions of the earth in its orbit. If the star under suspicion has near it some other star which is really immeasurably far away, the effect of parallax will make the suspected star alternately appear to approach and recede from the very distant one. It is by a determination of its position on the sky relatively to the surrounding small stars, therefore, that the parallax of a suspected star can be brought to light and estimated quantitatively. It is true that this involves the assumption that the surrounding stars are themselves immeasurably remote, and therefore without parallaxes. But experience has shown that this can be taken for granted almost invariably. So vast is the scale of the universe, and we have even yet but the very slightest notion of what *space* means. But Schur's measures of 61 Cygni have proved to be one of those unexpected cases where one of the "stars of comparison," as they are called, was itself not free from parallax. The tests applied to 61 Cygni included careful measurements of both components with respect to four small stars not far away on the sky. Observations were made with every effort at precision in the autumn of 1897, the spring and autumn of 1898, and again in the spring of 1899. Four epochs of parallax maximum were therefore observed, and the extreme accuracy of the work is well proved by the inter-agreement of the separate results. Now Schur finds that three of the comparison stars agree in bringing out for 61 Cygni a parallax not very different from the values obtained by previous observers. In other words, this famous star, far away though it undoubtedly is, can nevertheless be brought well within our powers of measurement. But what are we to think of the fourth comparison star? Contrary to all expectations, the observations show that if we are to assume this little star to be indefinitely far away, no satisfactory interpretation is possible with regard to 61 Cygni itself. We are therefore forced to the conclusion that the little star is in reality much nearer to us than is the stellar system of 61 Cygni. Indeed, we find from these ob-

servations that it has very nearly the largest of all known parallaxes. It is, with one exception, our nearest neighbor in space.

This remarkable little star is called W. B. XX 1688. Hitherto an object of no special consequence, it has never received a name, and is known only by its inconspicuous number in Weisse's re-reduction of Bessel's star-catalogue. It is, indeed, fortunate that we find an observation of it even there. For a comparison of the Bessel observation with recent ones contained in the catalogue of the *Astronomische Gesellschaft*, shows that this star has no so-called "proper motion"—that is to say, it is apparently really immovable on the sky, instead of having a slow drift athwart our line of vision. For the reader will recall that most of the fixed stars, and especially those having a very large parallax, are subject to such a drift or proper motion of their own. Here arises a most interesting point. The known drift through space of our own solar system ought to make this little star appear to have a large contrary proper motion. This is a necessary consequence of such close proximity. So we are driven to conclude that the little star itself must be moving in some manner connected with our own system. Its course is more or less parallel with ours, and its velocity approximately equal. If Schur's observations shall be verified, and prove to be correct, it is not too much to hope that we have really at last found our long-sought companion in space.

Astronomical and Astrophysical Society of America.—In the YEAR BOOK for 1898 attention was called to the series of astronomical conferences which have been held annually since 1897, and which we then thought would probably result in the establishment of a formal astronomical society in America. The third conference was held September 6-8 at the Yerkes observatory of the University of Chicago. A permanent organization was finally decided upon, and the following first officers and councillors were elected: President, Simon Newcomb, Washington, D. C.; vice-presidents, Charles A. Young, Princeton, N. J., and George E. Hale, Williams Bay, Wis.; secretary, George C. Comstock, Madison, Wis.; treasurer, C. L. Doolittle, Philadelphia, Penn.; council, E. C. Pickering, Cambridge, Mass.; James E. Keeler, Mount Hamilton, Cal.; E. W. Morley, Cleveland, O.; Ormond Stone, Charlottesville, Va.

The New Telescope of the Potsdam Observatory.—Of no small import to the progress of astronomy is the interest in that science manifested by the German Emperor. It is to his direct interposition that the Potsdam observatory owes its new 32-inch telescope; and we learn that he attended personally at the observatory to take part in the ceremonies connected with the final installation on August 26 of the present year. The Potsdam astrophysical observatory has been in existence only about a quarter of a century, yet it was probably the first institution to be devoted exclusively to this newer branch of astronomy. Its principal achievement has been the study of astrophysics, not as a thing separate and apart from astronomy in the older sense, but as an integral and important portion of the science as a whole. The Potsdam observatory made spectroscopic study an efficient engine of research when it placed upon a firm foundation the method of measuring stellar velocities in the line of sight. The first successful experiments in this direction were made by Huggins, of London; but it was not until photographic methods of obtaining stellar spectra had been perfected at Potsdam that the spectroscope took its proper astronomical rank at the side of the micrometer and meridian circle. But the Potsdam astronomers have hitherto been limited to observing the brighter stars. In order to photograph a spectrum, it is necessary to attach the spectro-photographic apparatus to the eye end of a telescope, so as to profit by the great light-gathering power of the latter. For when starlight is spread out into a spectrum it becomes so faint that we cannot successfully impress the sensitive surface of the photographic plate. To make this possible, we need the large object-glass of a telescope to gather the star's light and concentrate it to a focus. Clearly, then, if we increase greatly the size of our telescope, we can extend spectroscopic observations so as to include stars of only moderate brilliancy. And it is precisely when we wish to use the results of our observations for their most important purpose that we most particularly need measures of the smaller stars as well as the greater. We shall never have an adequate and satisfactory knowledge of the construction and mechanism of our universe until we can make statistical cosmic studies on a large scale, so as to include a very great number of stars of all magnitudes. For these reasons the Potsdam astronomers have repeatedly urged upon the Prussian authorities the desirability of increasing their instrumental equipment by constructing a telescope of the first rank as to size. But this application was without success until it became possible to enlist the interest of the emperor himself in the project. It is now confidently expected that the new instrument will make it possible to extend the Potsdam spectro-photographic survey of the heavens to stars of comparatively moderate size. It is estimated that not less than five hundred will come within the

spectroscopic light-gathering power of the new object-glass. As we have already said, the new lens is of 32 inches diameter, and it has a focal length of about 40 feet. The glass is from the factory of Schott and Co., of Jena, makers of the new varieties of glass now so famous for optical purposes. The grinding was done by Steinheil, of Munich, and the mounting and mechanical work is by the Messrs. Repsold, of Hamburg.

The German nation is to be congratulated upon at last taking its proper place among the nations of the world as the possessor of an astronomical telescope of first-rate size and power.

A New Photographic Telescope.—The YEAR BOOK for 1898 gives an account of the proposed new telescope which has been for some time in course of construction for the Paris Exposition of 1900. The most unusual peculiarity of this instrument is the remarkably large proposed focal length. Another new instrument, also with a very great focal length, is to be constructed at once for the observatory of Harvard College, Cambridge, Mass. It is hoped that these instruments will give us pictures of the planets and stars having the very large scale due to the long focus, and yet free from any compensating disadvantages.

Dark Stars.—Whatever we may think as to theories of cosmic evolution, it is impossible to escape the conviction that the stars may have individually a beginning and an end. However long may be the average star-life, the imagination cannot avoid speculating upon the commencement of that life and upon its probable extinction and end. When we contemplate a universe filled with brilliant points of light, in each of which we cannot but see a blazing sun, it is reasonable to ask: Are there not countless other stars that shone brightly in cosmic ages long since past, stars now but dark and dead? It seems probable, nay, more than probable, that such is the case. In the infinite extension of cosmic time so many stellar systems may indeed have ceased to exist that the dead may outnumber the living manifold. So there is nothing to prevent astronomers from assuming the presence of dark bodies almost anywhere in the universe. At times the observed motions of some visible star are found to disagree with the theoretical considerations of mechanical science. What more plausible than to imagine a companion star, dark, ponderous, massive, by its attraction disturbing the motion of the visible associate. Within the gravitational grip of such an invisible giant the star we see might suffer almost any perturbation of motion. But astronomers are very unwilling to adopt purely speculative theories. They are loath to believe in the existence of what they cannot see. And it must be admitted that such theories open the door to much pseudo-speculation. It is possible to hinder scientific advance by allowing too free a play to the imagination, just as that same imagination rightly used is the necessary moving force with him who would push onward the limiting bounds of human knowledge. Thus, it is desirable in no small degree that we should possess some actual tangible evidence that the dark-star theory is not merely imaginary. Fortunately, such evidence is not lacking.

There are two bright stars which were for a long time suspected of being accompanied with dark companions. Observations of the ordinary kind for determining the positions of these stars on the sky showed that they were at times disturbed a little from their usual place. Sometimes in advance, and then again somewhat retarded, they each showed a purely periodic variation in position. Nothing could be more plausible than to suppose that they had dark companions. In that case, star and companion would revolve about their common centre of gravity, thus throwing the visible star now to one side and now to the other side of its mean or average position. These two bright stars are Sirius and Procyon. In both cases, somewhat to the astonishment of every one, the supposed dark companions were at last actually detected visually. They turned out to be simply very faint stars, not quite dark, and they yielded readily enough to increased telescopic size and power. Sirius's attendant was discovered by Clark in 1862 with the then great telescope constructed for Chicago. But Procyon did not disclose his duplex character to the human eye until 1896, when Schaeberle first saw the tiny attendant point of light with the Lick telescope. These two cases of the actual discovery of an object previously only suspected on account of the gravitational perturbations it produced have, of course, given a strong appearance of verisimilitude to other cases in which the attendant star is still only suspected.

But further evidence of a character entirely different has been furnished from another source, the "variable stars." The reader will remember that the heavens contain numerous stars, whose light varies greatly from time to time. They seem to flicker, as it were, now shining quite brightly, and again losing almost all their light, so as to be seen only with difficulty even in the telescope. In some cases these light variations follow perfectly well-defined laws, which can be determined by observation. And in quite a number of cases the character of the light variation is such

that only one plausible explanation has been possible. We have been compelled to assume the existence of a dark companion accompanying the star we see and occasionally obscuring its light by passing between us and the lucid star. This theory, of course, means that the invisible body is very large, for the obscuration of the bright star may amount to cutting off a very considerable portion of its total light. Consequently, even if the dark companion should pursue an orbit which would at times place it in the most favorable possible position for intercepting the other star's light, it would nevertheless need to be nearly as large as the visible star in order to produce the effects that have been observed. It would be no mere satellite, but an equal companion of the visible star. Now there are, as usual, difficulties in the way. For how could the one twin star be bright, and the other altogether without light? However this may be, we are compelled to admit these supposed dark companions for some of the variable stars, for no other plausible explanation of their phenomena has been offered.

We have recalled the details of this matter thus at length, because of certain researches that have appeared this year and that throw some new light upon the dark-star question. There is a well-known binary star in the constellation Ophiuchus called 70 Ophiuchi. There are two visible components that have always been thought to revolve about their common centre of gravity in an elliptic orbit, and in accordance with Newton's law of gravitation. Now, of all the known binary stars, this one possessed, as we thought, about the best-determined orbit. The observations are so numerous, and the object is one admitting of such precise measurement, that the computed orbit could reasonably be expected to prove altogether satisfactory. It should have sufficed to predict the future motions of the star with all necessary precision for many years. For it is not merely the quantity and quality of the observations that make this binary star exceptional. Even the mathematical discussion of these observations, by which the orbit was obtained, has been effected by Schur, of Göttingen, with quite unusual elaborateness and care.

Astronomers were therefore much astonished to hear not long ago that the relative positions of the two components of this binary system differed very materially from the orbital prediction of Schur. The difference was altogether too large to be ascribed to unavoidable small errors of observation. Clearly the orbit itself was at fault. Investigation of a mathematical character soon showed that it would be difficult to reconcile the new observations with motion under the law of gravitation. Some astronomers were therefore led to postulate a third component of the system, probably quite dark, because altogether invisible in the most powerful telescopes, and revolving as a satellite about the smaller of the two visible components. This hypothesis was to be expected in the light of the considerations already set forth, and it is capable of reconciling these new discordant observations with the old orbit. It has led Moulton, of Chicago, to discuss mathematically in a very interesting way the intricate and difficult question of the mechanical stability of such a system as this hypothesis supposes 70 Ophiuchi to be. This discussion can be found in a recent number of the *Astronomical Journal*. It considers in general a cosmic system, composed of two major bodies, which for convenience are called the star and planet, and a minor body called the satellite, supposed to be revolving about the planet. The stability question at issue now is: Under what conditions can the system here postulated be permanent? Is it possible for such a system to avoid ultimate disruption under the influence of the gravitational forces governing its very existence? Moulton has been compelled to simplify his problem mathematically by assuming certain conditions, limiting somewhat its generality, but not affecting its value. He finds the following remarkable result: We may imagine planet and satellite each surrounded by an oval-shaped figure, and still another large oval enclosing them both. Then the satellite (if existing) may move inside either of the small ovals or outside the large one. But it cannot permanently move in an orbit anywhere else in the system. Furthermore, in some cases, we shall find the two smaller ovals uniting into a sort of hour-glass-shaped figure. When this occurs the neck of the hour-glass offers a passage for the satellite to escape from the planet to the star. This opportunity it would not be slow to embrace whenever the neck of the hour-glass was a large one. Such a system we should call unstable, for even if it could come into existence, it could not last long, astronomically speaking.

Moulton finally applies his mathematical formulas to the special case of 70 Ophiuchi. He finds it impossible that the system could be composed of three bodies revolving in the way that has been supposed. Such a system would not be stable, and cannot therefore be reasonably supposed to have an actual physical existence. The whole matter is left *sub judice*, awaiting further observations and mathematical investigations of the orbit.

Planetoids or Asteroids.—The following is a list of the asteroids discovered since No. 434, the last one mentioned in the YEAR BOOK for 1898.

No.	Temporary Designation.	Discoverer.	Date of Discovery.	Name.
435	DS	Wolf	September 11, 1898	
436	DT	Wolf	September 13, 1898	
437	DP	Charlois	July 16, 1898	
438	DU	Charlois	November 8, 1898	
439	EB	Coddington	October 13, 1898	Ohio
440	EC	Coddington	October 13, 1898	
441	ED	Charlois	December 8, 1898	
442	EE	Wolf	February 15, 1899	
443	EF	Wolf	February 17, 1899	
444	EL	Coggia	March 31, 1899	

Comets.—The following comets have been observed during the year 1899:

1899 *a* was discovered by Swift at the Lowe observatory on March 3. It was visible to the naked eye, though not as a conspicuous object. Later, it was very easily seen, and was described by Holetschek, of Vienna, on May 7, as resembling a hazy star of the third magnitude. At that time the comet's head had a diameter of about four or five minutes of arc, and there was a faint tail about 1° in length. On May 11, Perrine, at the Lick observatory, noticed that the head was separated into two parts. These were distant from one another about 12" on the sky. By May 18 this distance had increased to 18". On the 20th of the same month, Barnard, at the Yerkes observatory, also noted the duplicity of the comet's head, and found the distance between the two parts 29". On the 23d it had increased to 38", showing that the two parts were certainly separating. May 18 Barnard succeeded in photographing the comet, and the negative showed a faint tail no less than 8° in length. There was a sudden increase of brightness on June 5, which was noted by a number of different independent observers. After that the comet slowly faded away, until it could no longer be observed. The last telescopic observation was obtained July 31 by Cerulli in Italy.

1899 *b* was discovered by Wolf at Heidelberg, March 5, and proved to be a return of Tuttle's comet.

1899 *c* was discovered by Perrine at the Lick observatory, May 6, and was a return of Tempel's second periodic comet.

1899 *d* was also discovered by Perrine at the Lick observatory. It was first seen on June 10, and turned out to be a return of Holmes's comet.

1899 *e* was discovered by Giacobini at Nice, September 29.

ASTRO-PHOTOGRAPHY. See ASTRONOMICAL PROGRESS.

ASTROPHYSICS. See PHYSICS.

ATHLETICS, FIELD AND TRACK. The field and track athletic season of 1899 was one of considerable interest, especially in intercollegiate circles. The principal matters affecting the clubs were the efforts making toward doing away with the registration, in the larger clubs, of athletes resident in districts far removed from the club city. A movement was instituted also toward preventing the college undergraduate from representing athletic clubs while a member of his college team. The two principal intercollegiate events of the year were the international university games at London, referred to under the topic SPORTS, INTERNATIONAL, and the twenty-fourth annual intercollegiate games at New York, May 26, 27, under the Intercollegiate Association of Amateur Athletes of America. Sixteen of the 28 colleges of this association participated—namely, Boston, Columbia, Cornell, Georgetown, Hamilton, Harvard, Haverford, Lafayette, New York University, Pennsylvania, Princeton, Rutgers, Syracuse, Wesleyan, Williams, and Yale. Pennsylvania won with 57 points; second, Harvard, 28; third, Yale, 22½; fourth, Princeton, 11; fifth, Syracuse, 10; sixth, Cornell and Columbia, 5 each; seventh, Williams, 3. In all, six intercollegiate records were broken: Running broad jump, 24 ft. 4½ in., world's record, Kraenzlein, Pennsylvania; 120-yards hurdle, 15¾ sec. (beating the record made by Fox, Harvard, in international games in London), Kraenzlein, Pennsylvania; 2-mile run, 10 min. 3¾ sec., Grant, Pennsylvania; 440-yards run, 49¾ sec., Long, Columbia; pole-vault, 11 ft. 5 in., R. G. Clapp, Yale; quarter-mile event, bicycle meet, 30¾ sec., B. Ripley, Princeton. During the year, also, A. F. Duffy, East Boston A. C., is said to have done 100 yards in 9¾ sec., world's record time; Tewkesbury, Pennsylvania, did 120 yards in 12 sec. in the spring, ⅓ second slower than the world's record; John Flanagan, New York A. C., threw the 16-lb. hammer (7 ft. circle) 167 ft. 8 in., world's record; J. F. Powers, Notre Dame University, succeeded White, Cornell, to the annual individual all-around national athletic championship, by the largest score yet recorded. Cochems, Harvard, established a new strength-test record, with 1761½ points.

The Western intercollegiate championships were won by Chicago, 46 points; Notre Dame, 33; Michigan, 27; Wisconsin, 14 (previous champion for three years);

Illinois, 9. Six W. I. C. records were improved. The New England intercollegiate meet was won by Bowdoin, 23 points; Williams, 22; Amherst, 19; Brown, 18½; Wesleyan, 15. The tri-collegiate field meeting in New England was won by Williams, 64 points; Amherst, 38; Wesleyan, 33. An unusual number of dual meets were held in 1899. The eighth annual Harvard-Yale meet for the cup offered by graduates of the two institutions was won by Harvard, 54¼ points; Yale, 41¾; by this victory Harvard won the cup, having defeated Yale the necessary five times. Other dual meets were as follows: Princeton 72 points, Cornell 45; Princeton 61½, Columbia 42½; Chicago 106, Northwestern 38; Chicago 84½, Notre Dame 59½; Cornell 55¼, Syracuse 48½; Wisconsin beat Illinois; California 10 events, Leland Stanford 4. The New England, Middle, Atlantic, Metropolitan, and other divisions of the Amateur Athletic Union held the usual meets in 1899, the A. A. U. national championships being held August 26 at Waltham, Mass. Other important events were the early spring intercollegiate relay races, held by the University of Pennsylvania, and the annual meets of the New York, Knickerbocker, Boston, Chicago, and other large athletic clubs of the country. Abroad, Oxford and Cambridge each won five firsts in their annual dual games, making the result a tie. A half-mile run was added to the list of events in 1899. The year 1899 closed with preparations making for the most important season in history. The most important events were expected to be the Olympic games at Paris, in which nearly every branch of American athletics will be represented, and the international intercollegiate games proposed to be held in America. In connection with the Olympic games, several of the larger athletic clubs and the universities of Cornell, Columbia, Pennsylvania, and Princeton signified their intention of sending representatives abroad. An event of interest in the United States was the announcement of the University of California that it would send a track team to compete in the 1900 intercollegiate games, and to arrange, also, for dual games with some of the large Eastern institutions, including the universities of Columbia, Cornell, Pennsylvania, and Princeton, besides the University of Wisconsin in the Middle West.

ATKINSON, WILLIAM YATES, ex-governor of Georgia, died at his home in Newnan, Ga., August 8, 1899. He was born in the same State at Oakland in 1854. He was educated at the public schools and at the State University in Athens, being graduated from the latter in 1877. In the following year he was admitted to the bar and settled at Newnan. Governor Colquitt appointed him solicitor of the Coweta County Court in 1879, and he retained the position for about three years. Atkinson was elected to the legislature in 1886, 1888, 1890, and 1892, and during his last term was speaker. From 1890 to 1894 he was chairman of the Democratic State executive committee, and in the latter year, after a brilliant and successful contest for the nomination against General Clement A. Evans, was elected to the governor's chair. He was re-elected for the ensuing term. Atkinson was the founder and from 1889 the president of the board of trustees of the Georgia Normal and Industrial College, and from 1890 was a trustee of the University of Georgia.

ATMOSPHERIC ELECTRICITY. See PHYSICS.

ATMOSPHERE OF VENUS. See PHYSICS.

AUDUBON SOCIETY. See ORNITHOLOGY (paragraph Organizations).

AUSTRALIAN FEDERATION. The success of the federation movement in Australia was assured in 1899 by vote of New South Wales to adopt the proposed constitution. Before outlining the constitution and describing the situation in 1899, a brief sketch of the origin and history of the movement will be given.

History of the Federation.—Until a comparatively recent date the seven colonies of Australasia—namely, New South Wales, Victoria, South Australia, West Australia, Queensland, Tasmania, and New Zealand—had hardly more close political relations with one another than with foreign countries. But as time went on the interlacing of the colonies by railway lines and the increase in internal trade promoted a consciousness of common interests and led to a movement for closer union. The first sign of such a movement was in the proposal by Earl Grey in 1850 to bring about uniformity in the colonial tariffs, but neither this nor the projects discussed in the next ten years had any definite result. Another plan for concerted action on the part of the colonies was next discussed, and met with more success. It consisted in the holding of conferences from time to time to discuss certain subjects with a view to securing the passage of identical laws on these subjects in the different colonies. Such conferences were held from time to time between 1863 and 1883. Their success, however, did not come up to the expectations of the proposers of this plan. It was often found impossible to secure the adoption by the different colonies of measures approved by the conference. In the meanwhile the colonies had grown rapidly in wealth, and internal trade was increasing. The inconvenience of the customs duties on the intercolonial trade began to

be felt, and suggestions were made looking to a tariff union. At the same time political motives showed themselves. There was anxiety on the score of foreign aggression, and the conviction that the colonies could themselves best deal with matters affecting their own defence was deepened by Germany's seizure of New Guinea. This move on Germany's part had been foreseen by the colonies, and the government of Queensland had annexed the eastern portion of New Guinea, but the Gladstone government disavowed this action, and made light of the colonies' suspicions in regard to Germany. Almost immediately Germany seized the northern portion of New Guinea. These and similar causes led to the strengthening of the union movement in the decade 1880-90. As a result of this a federal council was established in 1884. This was a very imperfect form of union, but is significant as an important step toward more complete federation. The federal council was to deal with a class of specified subjects, and with such other matters as should be brought up by the colonial governments. The bill for the establishment of this council was rejected by the governments of New South Wales and New Zealand, but accepted by the other. It was recognized by the act of the Imperial Parliament in 1885, which permitted the forming of such a council upon the demand of three of the colonies. Several meetings were held between 1886 and 1891, but they had no important results, save to convince the people of the inadequacy of the system. The small membership—only from six to eight members—and the fact that the most important of the colonies, New South Wales, did not support it, deprived it of influence. Still more fatal to its efficiency was the right not only for a colony to refuse to send a delegate, but of a delegate to withdraw whenever a measure objectionable to his own government was adopted. It had no executive, no judiciary, and no control over revenue. The movement for a stronger form of union was set on foot by Sir Henry Parkes in 1889-90. He demanded "a dominion parliament in the dominion of Australia," and the demand being favorably received, a conference was called to consider definite plans for submitting the question to the colonies. The conference adopted resolutions favoring the establishment of a colonial union and providing for a constitutional convention. There was some opposition to this proposal, but it was carried out in the following spring. The convention for drafting the constitution met at Sydney, March 2, 1891. The draft was very similar to that which was subsequently enacted, and of which a summary is given in a succeeding paragraph. The convention then resolved that the colonial parliaments should submit this draft to the people, and, after its adoption by three of the colonies, that it should be referred to the Imperial Parliament for approval. The opposition continued, and checked progress for several years. The parliaments took no action in the matter. At the same time the friends of federation formed a number of federation leagues, which carried on actively the campaign for a federal union. These leagues in 1893 sent delegates to a conference at Bendigo, in Victoria, and it was there decided that the colonial parliaments should be urged to authorize by law the calling of a new constitutional convention, whose members should be chosen by popular suffrage. In order to carry out this plan, a meeting of five premiers was held at Hobart in 1895, and the draft of an act for such a convention was agreed upon, to be submitted to the legislatures of the five colonies which they represented. This convention was to submit the draft of a constitution to the colonial parliaments for discussion, and was then to consider the question of amendments, and the draft was finally to be submitted to the vote of the people. The convention was not held until 1897, when it met at Adelaide, all the colonies except Queensland and New Zealand having agreed to choose delegates. It drew up a federal constitution based on that of 1891, and remained in session until March, 1898, when the constitution was ready for submission to popular vote. It was provided that, if three colonies ratified the constitution, application might be made to the imperial government for an enabling act. There was a definite minimum fixed for the affirmative vote in each state. New South Wales raised the minimum from 50,000 to 80,000, and thus defeated the measure. Victoria, South Australia, and Tasmania gave more than the necessary majorities, but the affirmative vote of New South Wales fell below the minimum. West Australia and Queensland cast no vote. The adverse decision of New South Wales, and the fact that two of the three colonies voting in the affirmative were relatively unimportant, prevented the application for the enabling act from being made. The opposition of New South Wales was attributed to an unwillingness to be a member of a federation in which she did not have a preponderant influence. As the parent colony from which Queensland and Victoria were offshoots, she was unwilling to assume merely an equal footing. She made numerous objections against the proposed constitution, and some of the changes which she suggested were the location of the federal capital in New South Wales, the right to exercise full control over the New South Wales rivers, the payment of bounties by the states and not by the federal government, and the lightening of the financial burden which the new instrument would

lay upon the colony. The modifications proposed by New South Wales did not meet the approval of the other colonies, and for the time being the progress of federation was checked. The proposal of Premier Reid of New South Wales for a conference to submit amendments desired by his government was refused by the other premiers.

Federation Movement in 1899.—On January 26, the premiers of Victoria, West Australia, Tasmania, and Queensland met at Melbourne, and agreed to modify the scheme for federal union in such a manner as would be likely to remove the obstacles to its adoption. The principal change had to do with the financial relations of the states. It was also provided the federal capital should be in New South Wales on federal ground, and at least one hundred miles from Sydney, but that parliament should meet at Melbourne until the government buildings were ready, and that an absolute majority in joint session should prevail when the two houses disagree. These and other changes served to remove the chief grounds of opposition, and the passing of an enabling act was now regarded as certain, since New South Wales pledged itself, through its premier, to accept the federal constitution. In March, South Australia adopted a bill for submitting the scheme to the people. In the legislature of New South Wales there was still a vigorous opposition to the measure, but after the appointment of additional members of the legislative council it was agreed that the amended bill should be submitted to the electors. The vote was taken on June 20, and showed a majority of over 20,000 for federation. The minimum principle was not established. During the summer and early autumn Victoria, Queensland, and Tasmania accepted the federal enabling bill as amended, and the only thing lacking to the establishment of the constitution was the consent of the Imperial Parliament. West Australia refrained from voting on the measure, as it did in 1898, a joint committee of its two houses of parliament reporting that the colony could not safely join the federation until amendments had been made in regard to the election of senators, the customs tariff, and some other matters. It was held, too, that the plan of federation did not safeguard the financial interests of the colony.

The Constitution—General Character.—Three plans were discussed in the course of the debates on federation. The first was that of a loose confederation framed on the basis of the existing federal council, but this received slight support. The second followed the Canadian model and concentrated powers in the hands of the central government without regard to the principle of states' rights or the sentiments of the colonies. These sentiments were too strong to admit of its success. The third plan was based to a large extent upon the American model, being a sort of compromise between the highly centralized system contemplated in the second plan and a system conferring on the states all the powers that they possess under the constitution of the United States. In general, to the federal government were to belong certain specified powers having a much wider range than in the United States, and all powers not expressly delegated were to inhere in the state government, and, while the constitution of this country was appealed to in the discussion of almost every point, there was no exact reproduction of the method of government. In many respects the delegates showed their disapproval of our system. The main points in which they took the United States constitution as a model were in regard to the federal supreme court, the election of senators, the equality of the states, the initiation of money bills, and the relations of the two branches of the legislature.

Federal Powers.—The official title of the new federation is the Commonwealth of Australia, and its component parts are termed no longer colonies, but states. The term original states is applied to those which formed parts of the commonwealth at the time of its establishment. The executive power is vested in the Queen and in her representative, the governor-general. There is also to be an advisory council, known as the federal executive council, whose members shall be chosen by the governor-general and hold office during his pleasure. These members shall be officially known as the Queen's ministers of state for the commonwealth and, until the parliament otherwise provides, they shall not exceed seven in number. The command in chief of the naval and military forces of the commonwealth is vested in the governor-general as the Queen's representative. The legislative power is vested in a federal parliament consisting of two houses—a senate and a house of representatives. The senate is formed on the principle of equal representation for the states, and its members are to be directly chosen by the people of the state. It is provided that until parliament otherwise orders there shall be six senators for each original state. Each senator is to be chosen for a term of six years. The house of representatives is based on the principle of representation according to population. The members shall be chosen for a term of three years. The powers of parliament are very extensive. Among the subjects of its jurisdiction are trade and commerce with other countries, taxation, borrowing money, postal, telegraphic, telephonic and other like subjects, and naval and military defence of the common-

wealth and the various states, insurance other than state insurance, and state insurance when it extends beyond the limits of the state concerned, naturalization and aliens, foreign corporations formed within the limits of the commonwealth, marriage and divorce, invalid and old-age pensions, immigration, quarantine regulations, etc. It is provided also that parliament may assume control of the railways with the consent of a state and may legislate in matters referred to it by the parliament or parliaments of any state or states. This is enough to show the exceedingly wide scope of the federal powers. The chief point of difference between the Australian system and that of the United States is the establishment of ministerial responsibility. This gives the supremacy to the house of representatives, since it is that house to which the ministry is responsible. A discussion of some of the federal powers in detail may throw some light upon the possible workings of the system and upon the difficulties which so long prevented its adoption.

The Financial System.—On the question whether the new federal government should assume the state debts there was much diversity of opinion. It has been estimated that the state debt, inclusive of municipal and county debts, is nearly £200,000,000, and while the states have large assets in the shape of public lands, railways, etc., the burden of this debt is pressing at the present time. A consolidation of the various state debts would, it was hoped, reduce the interest. The federal control was also favored by some in the matter of the railways, since a consolidated system would present fewer difficulties than the present system of state control. The tariff was another cause of dissension. With the exception of New South Wales, all the colonies derived a portion of their revenue from tariff upon the imports from the other colonies and from the outside world. These duties, with their vexatious restraint of internal trade, were viewed with disfavor by many, and there had long been a strong party working for their abolition. West Australia, however, the youngest of the colonies, was unwilling to abandon her tariff, since nearly one-half of her revenue is derived from the duties on goods imported from her neighbors, and the abandonment of the tariff would force her to have recourse to direct taxation. Another problem was the matter of surplus revenue, since it was expected that the new government would receive a revenue in excess of its expenses. In respect to all these matters the new constitution provides as follows: In the first place, the state debts are not for the present assumed by the federal government. The assumption of federal control over the railways is conditioned upon the consent of the state or states in which the railways lie. The system of internal border duties is abandoned, although it is agreed that the federal government shall adopt the policy of protection for the whole commonwealth against foreign countries. As to the distribution of the surplus revenue from the federal tariff and excise, it is provided that "during the period of ten years after the establishment of the commonwealth and thereafter, until the parliament otherwise provides, of the net revenue of the commonwealth from duties of customs and of excise no more than one-fourth shall be applied annually by the commonwealth toward its expenditure. The balance shall, in accordance with its constitution, be paid to the several states and applied toward the payment of interest on debts of the several states taken over by the commonwealth." This arrangement, known as the "Braddon blot," has been criticised for its clumsiness and for the complicated system of book-keeping in which it would result. The limitation of its operation to a period of ten years was due to the insistent demands of New South Wales.

The Relations of the Two Houses.—The great constitutional problem which had to be faced was that of states' rights, the smaller states showing jealousy of the larger and objecting to a system that would base power upon population. This jealousy is one of the things that checked the federation movement, since the delegates from certain colonies were constantly threatening to withdraw when the matter of the distribution of state powers seemed likely to be adjusted in a manner objectionable to their governments. The chief question was that of the control of money bills in parliament, since the possession of this power would, of course, carry with it a paramount influence in the government. The smaller states contended for the principle that the senate should not only have the right to reject, but to amend money bills proposed in the house. A denial of this right to the senate meant control by the popular branch of the legislature. In their desire to prevent this the delegates from the smaller states were willing to give up the cabinet system and to accept a form of government based more precisely upon the model of the United States. An apparent compromise was reached by giving to the house of representatives power to originate money bills and to the senate the power to reject, but not amend them. By money bills are meant taxation bills and bills appropriating money for the ordinary annual expenses of the government. At the same time the senate may return bills with suggested amendments, which the house may incorporate if it sees fit. This really gives the preponderant power to the larger states, since the membership of the house is based on population. The introduction of the cabinet

system prevents equality between the two houses, since the ruling body must be the house, to which the ministry is responsible. Such an arrangement necessarily denies the principle of equality of the states, for the two colonies of Victoria and New South Wales, on account of their superior population, will have a majority in the house of representatives. But the existing system gives the senate power to check legislation, and therefore makes it likely that deadlocks will occur. This result was in fact contemplated by the constituent convention, and a number of remedies were suggested, among others a submission of the matter to direct popular vote. As finally adopted the constitution provides that if the senate rejects a bill passed by the house, a dissolution of parliament may be ordered, and that if the newly elected senate rejects the measure a joint session of the two houses may be called by the governor-general and the question shall be decided by a majority vote. Thus ultimately population will control, but the senate will have the power of interposing a considerable delay.

AUSTRIA-HUNGARY, an empire in the interior of Europe with a frontier of 5396 miles. Its area is 240,942 square miles and its population on December 31, 1890, was 41,358,886, but in 1896 was estimated at 43,800,213.

Agriculture and Mining.—There is great diversity in the natural products of the empire. Agriculture is the chief occupation, furnishing about three-tenths of the population with employment. According to the figures for 1897 the leading crops of cereals in Austria were oats, rye, barley, wheat, maize, pulse, and buckwheat. In Hungary, in 1897, maize was the leading cereal product, and the other principal crops were, in the order of their importance, wheat, oats, barley, and rye. The chief vegetable products in both divisions of the empire were potatoes and beets. In 1895 41.43 per cent. of the land was classified as arable, and in Austria, according to the latest official figures, 36.7 per cent. of the total area was classified as arable and garden lands. Woodlands made up 27.8 per cent. of the total area of Hungary and 32.6 per cent. of the total area of Austria. The forests, which are administered by the government, abound especially in the mountainous districts. The chief minerals of Austria, according to the value of their respective outputs in 1896, were brown coal, black coal, pig-iron, and salt. In Hungary the chief mining products in the order of their value in 1897 were pig-iron, lignite, coal, and iron ore. The other mineral products in the empire include gold, silver, lead, copper, manganese, sulphur, zinc, alum, petroleum, quicksilver, graphite, antimony, and iron pyrites.

Manufactures and Foreign Trade.—The trade of Austria-Hungary for the year 1898, exclusive of specie and the precious metals, was as follows: Imports, \$327,920,000; exports, \$323,048,000. For several years there has been a depression in some of the important industries of the empire and a consequent falling off in the export trade. Official details showing the exact condition of manufactures and foreign trade in 1899 were not available, but the following facts taken from the United States Consular Reports of July, 1899, illustrate the present conditions. In the two important industries of cotton spinning and linen manufacture there has been a marked falling off in the last few years, and in many cases it was reported that the business was carried on at an absolute loss. This decline was clearly manifested in the cotton spinning industry at the close of the year 1896. The operators thereupon made efforts to improve the condition of the industry, but lack of harmony among them prevented the success of these efforts, and, during the year 1897, only 3 per cent. of the product of the Austrian cotton spinning factories sold in foreign markets. This depression continued throughout the year 1898. In the linen industry the exports for 1898 declined both absolutely and relatively from the figure which they reached in 1897. This was partly attributable to the poor flax crop and the diminution of flax culture. It was said that the home product decreased 25 per cent. and the amount of imported flax increased 40 per cent., thus seriously injuring the rural flax producers of the empire. The depression was also attributed to the lowering of prices and to the increasing competition, and it was further complained that taxes and trade regulations tended to hinder the expansion of the industry. The controversy between the two divisions of the empire over the *Ausgleich* was another cause of the depression, since under ordinary conditions one-half of the linen product of Austria is consumed at home, a large part of it being taken in Hungary. The outlook was considered bad in 1899, since the compromise between Austria and Hungary providing that the products of both countries shall be interchanged free of duty seemed likely to be of short duration. It was the policy of the Hungarian leaders to contend for the renewal of the *Ausgleich* only until 1902, when Hungary would adopt a system of protection against Austria as well as against foreign nations, and at the same time take steps to promote the industries within its borders. The condition of the export trade at last drew the attention of the government, and the ministry of commerce submitted a series of suggestions to a conference of exporters on March 8, 1899. These suggestions looked to the promotion of the export trade by sending technical experts to foreign countries to study

and report upon the condition of particular industries. The candidates were required to possess a competent knowledge of languages and of the industries that they represented, and before they left the country to familiarize themselves with the condition of those industries at home. Each expert was to receive a regular compensation from the government, which was to be increased if he proved his fitness for the work, and which was to be supplemented by additional compensation for the business which he brought to his principals, in such manner as might be agreed upon between them. These proposals did not meet with the approval of the industries concerned. The latter complained that the government's plan differed from their own and that it was meant to thwart their purposes. It was predicted also that the experts would probably be chosen for political reasons, and that certain exporters favored by the government would receive all the benefits from the system. The extent to which the racial question enters every field was illustrated in this case by the opposition of certain newspapers on the ground that the scheme bore evidence of the government's desire to propitiate the Czechs and Poles to the disadvantage of the German element. A stronger objection than any of these was the view that government control and management of export transactions was undesirable and impracticable. The government plan was opposed chiefly on the ground of government control, for in its principles it was like that of the exporters themselves. The idea of sending young and energetic business men to study the conditions of certain industries at important centres of trade met with general favor. It was proposed that these experts should be maintained in China, India, Egypt, South Africa, Asia Minor, Japan, and the United States, and that they should remain there for a term of years, understand the language spoken, and possess in advance a thorough knowledge of the industries which they represented. Another method that has recently been discussed for increasing the Austrian export trade is the establishment of colonies, and it was several times reported in 1899 that the government was inclining toward a policy of colonial expansion. Among the means already taken for developing foreign commerce has been the establishment of an export academy at Vienna whose object is to fit young men to become exporters. It is under the direction of the Austrian ministry of commerce. It was designed to meet the complaint of Austrian exporters that the nation had no fit commercial representatives abroad, and was therefore at a great disadvantage in its competition with Germany in foreign markets. The export academy has been made an integral part of the Imperial Royal Commercial Museum, and has the use of its library. The curriculum appears to be well fitted to the object of the institution, and the proposed standard in the matter of attendance and scholarship is high. No more than thirty students are admitted to a class of the academy, and no more than twenty to a class of the preparatory school. The preparatory course lasts one year and is succeeded by the regular course of two years. In 1899 only the first of the two-year courses was opened. Its curriculum includes the French and English languages, domestic and foreign law so far as it concerns commerce, and practical exercise in the office work of export, import, and factory businesses. The school hours are long and the student is required to give his time outside only to the languages and the office lessons. There are so-called seminaries in which the economics of tariffs and international trade and usages of the export trade, commercial geography, and a knowledge of the world's products are taught in a practical manner.

In Austria-Hungary and in several other European states there was some alarm expressed at the danger of American competition. The remarkable expansion of American industries was noted there, and the great increase in the exportation of goods from the United States to Europe. A prominent Austrian professor of political economy drew attention to the fact that the exports to Europe from the United States were double the imports from Europe to the United States, and expressed the fear that when the United States had succeeded in placing the sugar production in Cuba and Puerto Rico upon such a footing that it would be sufficient for American needs, the favorable balance of trade would be still larger. Reference was also made to the great increase of the American paper industry, which has outdone that of England. American pig-iron, too, is finding its way into markets which were formerly supplied by other countries, and American machinery was becoming to be known as the best in the world. Progress of chemical science in the United States was also noted as likely to menace the markets of other countries for their chemical products.

Railways, Telegraphs, and Posts.—The length of railways open to traffic in Austria in 1897 was 10,438 miles, in Hungary it was 9784 miles, and in Bosnia and Herzegovina 481 miles. In 1897 there were in Austria 31,484 miles of telegraph line, and the number of messages carried was 13,771,084; in Hungary 13,375 miles of telegraph line, and 13,396,578 messages carried. In 1897 there were in Austria 809,770,210 letters and postal-cards carried in the mails, and in Hungary 236,825,000.

Finance.—According to the *Ausgleich*, a decennial compact which dates from 1867 but expired in 1897, the amount required for the common affairs of the empire is levied after deducting the proceeds of the common customs upon Austria and Hungary, Austria contributing 68.6 per cent. and Hungary 31.4 per cent. This arrangement was continued provisionally during the recent disputes over its renewal for the decennial period. The outcome of these disputes is stated in a succeeding paragraph. The estimates for common affairs for 1899 placed the revenues at 167,175,940 florins, the florin being equivalent to 20.3 cents in United States currency. In 1898 the general debt of the empire was 2,757,449,395 florins. Austria's special debt was 1,470,788,879 florins, and Hungary's in 1897 was 2,477,945,000. There is in addition a common floating debt which in 1898 amounted to 182,672,730 florins.

HISTORY.

Political Situation.—The long-standing disputes over the *Ausgleich* and language ordinances continued in 1899. The *Ausgleich*, it will be remembered, is a decennial pact or compromise, which has bound together the two halves of the monarchy ever since 1867, and which regulates their financial and economic relation. This pact is renewable every ten years. In 1897 the two governments of Vienna and Budapest not being able to come to an understanding upon the renewal for ten years, the compromise was prolonged provisionally. On January 1, 1899, it was prolonged to the close of that year. This prolongation was not the result of legislative action, the opposition of the German Liberals having prevented this, but was brought about solely by virtue of paragraph fourteen in the Austrian constitution, an emergency clause, which gives the government absolute control in default of legislative action. For this resort to an absolute *régime*, parliament was mainly responsible, since the obstructive tactics and the disorderly scenes which marked its sessions had rendered constitutional government impossible. In the meanwhile, the dispute over the language ordinances seemed as far from settlement as ever. These ordinances, it will be remembered, were a modified form of the Badeni measures, and while they did not go as far as the Slavs demanded toward making their tongue the predominant and official language of the Slavic divisions of the empire, they went far enough to provoke the continued opposition of the Germans. For the greater part of the year 1899 the Thun ministry continued in power. In general it followed the policy of its predecessor, the Badeni ministry. It was supported in parliament by all the Slavic and Clerical-German elements and was violently opposed by the German Liberals, who accused it of aiming at federalism and the political destruction of the German element in the empire. This opposition on the part of the German Liberals caused a parliamentary deadlock, and the Thun ministry, finding it impossible to govern by parliamentary means, had recourse to government by ordinances. In this way it secured the financial means for carrying on the government and continued the compromise with Hungary. Its political enemies accused it of aiming to turn Austria into a Slavic empire, of filling the offices with Slavs, and of overthrowing the centralized *régime* in favor of a federal system. The sessions of the *Reichsrath* in the beginning of the year having been marked by the same disorders as characterized its former meetings, Count Thun finally prorogued it on February 1, 1899. The government by ordinances was described as an absolutism, which had been rendered necessary in the circumstances by the failure of constitutional government. The situation was complicated by the fact that in Hungary the compromise which was maintained in operation was not actually voted for, because the parties could not come to an agreement.

Political Situation in Hungary.—The failure of the Hungarian Diet to vote the renewal of the compromise arose from the same obstructive tactics on the part of the opposition at Budapest as were pursued in Vienna. The situation at one time seemed even worse in Hungary than in Austria. Parties could not unite. One of the chief obstacles to reconciliation was Baron Banffy, whose important services to Hungary and to the cause of Liberalism did not mollify the hatred with which he was regarded in certain quarters, especially by the Clericals. Finding that union would be impossible so long as he remained in power, Baron Banffy resigned office on February 26. He was succeeded as prime minister by M. Koloman de Szell, a Liberal, but with less radical views than Baron Banffy. The only changes made in the cabinet were the appointment of M. Alexander Plosz as minister of justice and M. Alexander Hegedus as minister of commerce. The formation of this new ministry put an end to the parliamentary crisis, and the Diet promptly voted the provisional renewal of the compromise. It was now possible for the two halves of the empire to negotiate for the establishment of permanent union. The chances for parliamentary government in Hungary greatly improved, owing to a rearrangement of political parties. A faction of the Nationalists joined the Liberals, and some of the political leaders showed a change of front. See HUNGARY.

Failure of the Thun Ministry.—The Thun ministry had the support not only of the

Slavs and the Clericals, but of the Austrian feudal nobility. On the other hand, the hostility of the Germans both in and out of parliament was extreme. Troubles arose in the frontier districts, and the military were called in to restore order. The Germans accused the authorities of acting in an arbitrary manner and of suppressing every manifestation of opposition to the government by force. Down to the summer of 1899 it seemed as if the Emperor, who had interfered on behalf of the Slavs when Badeni was in power, would continue to support the ministry of his successor, but in the course of the summer there were reports of a change in the imperial policy. It was said that the Austrian ambassador to the court of St. Petersburg had placed in the hands of the Emperor a memorial, which he had found among the papers of Count Kalnoky, whose executor he was, setting forth the injurious effect upon the Austro-German alliance which would surely follow the adoption of an internal policy hostile to the German element. Count Kalnoky deprecated any concession to federalism, and declared that the foreign policy of the empire demanded that the German element should be no longer discriminated against. Soon after this it was evident that the Emperor had resolved to modify the internal policy which was favored by the parliamentary majority, and it was rumored that he was planning to secure the repeal of the language ordinances in the hope of appeasing the Germans and permitting parliamentary business to be resumed in a regular way. The repeal of the ordinances appeared to be the only means of removing the German opposition. The situation was no longer endurable. Austria had been without a parliamentary government since February 1, and the administration had been that of virtual absolutism under the emergency clause of the constitution. The restoration of peace in parliament was necessary in view of the approaching session of the Austro-Hungarian delegations, which decide each year upon the common questions of the dual monarchy. The election of the Austrian delegation required the convocation of the *Reichsrath*, and the question was whether the *Reichsrath* would be of a mind to resume its regular duties. The strong majority of the ministry was thwarted by the obstruction of the Liberal and anti-Slav minority. The elements that supported the ministry tended toward Slavism and Clericalism and, up to a certain point, toward federalism. On the other hand, the Germans made the solution of the language problem in their favor the paramount object of their policy. The struggle was a phase of the wider conflict between Slavism and Germanism in Austria, whose issue will have important effects not only upon the very existence of Austria, but also upon all European politics as soon as the throne becomes vacant. Government by ordinance, which had been going on for a period of nine months, could not be indefinitely prolonged. This was the situation in September, when the election of the Austrian delegation became necessary. There were several expedients for avoiding the necessity of that election, but they were not practicable in view of the fact that any further transgression of law in the domain of common affairs would irritate Hungary, which had demanded that affairs concerning the relations between Austria and Hungary should henceforth be regularly conducted. An effort was made to bring about a compromise between the hostile parties, but it failed. At this juncture the cabinet resigned, knowing that if it remained in power, the Austrian delegation could not be chosen. The Emperor first approached Prince Alfred, of Liechtenstein, but this choice was undesirable, since Liechtenstein represented the tendencies of the Thun ministry, and a neutral ministry was the only one that would be acceptable to all parties. The Emperor, in the course of a journey in Bohemia, and on the occasion of the manoeuvres and of a visit to Styria and Tyrol, had frequently declared his opinion that a change in the internal policy of Austria was absolutely necessary, and that in order to bring it about he counted upon the support of the German party in parliament. The prime object was to bring back Austria to the path of constitutional government. In the meanwhile, the language question was causing serious disturbances in the empire.

The Language Difficulty.—As an illustration of the peculiar difficulties involved in the government of the polyglot empire, it may be mentioned that the race feeling penetrates the army itself and often threatens its unity. Until recently it has been the custom for the reservists on presenting themselves before the military authorities to answer to their names in their native tongue. It is evident that a common language for command is necessary. This language was German, and the non-German reservists objected to it. The different nationalities composing the army rebelled against the necessity of signifying their presence by the German word *hier*. Slight as this point seems, it threatened to divide the army by a serious race conflict. The war administration, making this a matter of discipline, took measures to suppress the agitation against the use of a common language for military commands. They demanded now that the reply to the roll-call should be made in German, and all who disobeyed were subjected to military punishment. Many of the reservists did disobey, and were sent to the military prison for breach of discipline. The people took the side of the reservists, accompanying them in a procession to the prison, and

gave them an enthusiastic welcome when they came out after the expiration of their term. This and other evidences of racial antagonism led the crown to demand an immediate reversal of the internal policy, and as a practical step in that direction the prompt suspension in Bohemia and Moravia of the language ordinances. These ordinances had been adopted two years before through the intervention of the crown, and now their repeal was urged from the same quarter.

The New Ministry.—In forming the ministry, the idea was to fill it with officers who were not bound to political parties. The presidency was intrusted to Count Clary-Aldringen, who kept but two ministers of the previous cabinet—namely, Count Welsersheimb, minister of national defence, and Herr de Wittek, minister of railways. The ministry was formed on September 28. Before confronting the *Reichsrath*, which met on October 2, it tried to conciliate the Germans by announcing that the language ordinances would be repealed.

The Language Ordinances.—The language ordinances were immediately abolished, and when the *Reichsrath* met the Germans ceased their opposition. On the other hand, the Poles, Southern Slavs, and Czechs united with the German Clericals and the representatives of the feudal nobility in opposition to the government. Their object was to obtain for all the languages spoken in the empire a footing of equality. Outside parliament some of the districts peopled with Germans were the scene of agitation against the suppression of the ordinances. The movement was mixed up with anti-Semitism. Several shops were plundered and set on fire, and the gendarmes, being hard pressed by a crowd of rioters, fired upon them, killing several and wounding others. In the *Reichsrath* the prevailing opinion was that the gendarmes had had too hasty a recourse to arms. As to the responsibility for the affair, the anti-Semites charged the Czech partisans, and the latter threw the blame upon the anti-Semites. In this state of affairs the Clary cabinet dared not put into force its measures for the repeal of the ordinances. Count Clary announced at the first meeting of the Chamber of Deputies on October 2 that he aimed to establish the parliamentary régime and the respect for the constitution, and that he would not have recourse to government by virtue of paragraph fourteen. As to the suppression of the language ordinances, he promised formally to seek the legal means for solving the language problem, and said the object of the government was to draw up a measure which would meet the needs of every country and conform to the necessities of a uniform administration. The opposition of the majority left all the projects of the ministry unfulfilled. It could not secure a debate upon the military contingent or any discussion of the measures necessary for executing the compromise concluded with Hungary. The question was whether the *Reichsrath* would not be paralyzed again by an obstruction of a new kind—that is, an obstruction offered by the Czechs in place of that which had hitherto come from the Germans. The three chief points in the programme of the ministry were, first the resumption of regular parliamentary business; second, the choice of the Austrian delegation, and third, the passage by the *Reichsrath* before December 31 of certain legislative measures necessary to put in force the compromise with Hungary. The *Ausgleich* had been regularly voted by the Hungarian Diet in June, and its terms were satisfactory to Hungary, but its renewal on the part of Austria was brought about solely by virtue of the ordinance power based on paragraph fourteen of the constitution. According to the provisional renewal of the *Ausgleich*, voted by the Hungarian Diet in June, the previous rules governing the relations of the two parts of the monarchy were to remain in force until December 31, 1907, provided that Austria should renounce the modifications which she had demanded in her favor and which Hungary refused. After the year 1901 the two governments were to negotiate for the renewal of the treaties of commerce for foreign countries, but if by January 1, 1903, they were unable to agree upon the renewal of the *Ausgleich*, after 1907 these treaties of commerce should not be prolonged, except by special arrangement. An autonomous customs tariff should be replaced by a tariff which should take account of the agricultural and industrial interests of the two parts of the monarchy. Existing treaties of commerce should be denounced upon the demand of either of the two governments on January 1, 1903, without waiting for their expiration. The Clary ministry succeeded in carrying out the first and second parts of its programme—namely, the resumption of parliamentary business and the election of the Austrian delegation. In the matter of the *Ausgleich* it failed to obtain the vote of the Austrian Diet. The opposition of the Slavs and Clericals in the *Reichsrath* had at first checked the discussion of the *Ausgleich*, and it was not until the Emperor had personally intervened on behalf of the ministry that a convention was concluded with Hungary. This convention, which was reached after two years of negotiations and of fruitless attempts, changed the proportion of the quota paid by each part of the monarchy for the common expenses. Instead of being 31.4 per cent. for Hungary and 68.6 per cent. for Austria, it became 34.4 per cent. for Hungary and 65.6 per cent. for Austria, which meant an increase in Hungary's share of the common expenses

of 3,000,000 florins, for which she was compensated by a redistribution in her interest of the so-called imposts of consumption. In the Austrian parliament the feudal and Clerical majority were bent on overthrowing the Clary cabinet, and the attempts to reconcile the Czechs with the Germans failed on account of the language dispute. The Czechs demanded that before coming to an understanding with the Germans they should receive satisfaction for the abolition of the language ordinances. They required that in the courts and in all the bureaus in countries where the Czech tongue prevailed that language alone should be used. The open obstruction of the Czechs, together with the passive resistance of the Poles and Clericals, prevented any parliamentary legislation, and as the end of the year approached the government could not obtain a vote upon the budget, upon the military contingent, or upon the imposts, and the compromise with Hungary seemed as far away as ever from the chance of parliamentary adoption.

Ministerial Crisis.—The Clary ministry resigned on December 21, owing to the continued obstruction practised by the majority in the parliament and the impossibility of carrying out its programme. To carry on the administration it was now necessary to vote provisional credits. The Emperor appointed a new ministry under the presidency of Herr de Wittek, the former minister of railways. In the failure of parliamentary action, the Hungarian and Austrian delegations voted a provisional arrangement for the common expenses for four months, and the Emperor, on the strength of the ordinance power intrusted to him by the constitution, fixed for six months the quotas of Austria and Hungary. Thus, at the close of 1899 the monarchy found itself in a dangerous situation. The bad state of political affairs reacted upon the economic interests of the country, and the divergent tendencies of the separate nationalities threatened to lead to further difficulties in the future. The De Wittek ministry, like that which it succeeded, was a ministry of functionaries. So far as the immediate purpose was concerned—namely, to provide for the needs of the state by means of ordinances, it fulfilled its task, but it was of necessity merely transitory.

The Future of the Monarchy.—It has been repeatedly said that the sole tie that binds the discordant nationalities of the empire is their loyalty toward the ruling Emperor, and that after his death the centrifugal forces would be too great to admit of the empire's existence in its present form. Some went so far as to speculate upon the sharers in the doomed empire, claiming that Russia, Germany, and Roumania would divide the lands among them. Some said that the destruction of the empire was inevitable, and that it would occur soon after the death of the Emperor. Others held that it might be prevented by the action of the European powers, and this should be taken, since the balance of power would be endangered by a division of the territory. Such a division, if made, would, it was generally thought, take place on the basis of nationality, and this would lead to some serious complications. Germany, for example, would cease to be Protestant and Prussian, and would become Catholic and Austrian. These speculations had no immediate and practical value, save as indicating the seriousness of the situation and the need of harmonious action on the part of the different nationalities of Austria if the disaster to the empire is to be averted.

AUTOMOBILE. Motor vehicles, or automobiles, as they are now quite generally designated, have been kept constantly before the public during 1899 by means of exhibitions, clubs, races, and trials of various kinds. The company-promoting feature of this industry has, however, shown a welcome tendency to die out, and it may be reasonably expected that in the near future the building and exploiting of motor vehicles will assume the responsible and business-like position of other similar industries. Mechanically the progress of the year in motor vehicles follows along two distinct lines of development. The essential lines of construction have undergone no radical change, but the experienced mechanical engineer has come to the aid of the less skilled originator and has brought about a notable improvement in the design of the various details and in the quality of the material and workmanship employed in manufacturing them. This is the first and, in some respects, the most notable of the two lines of advance; the second is the development of the motor vehicle for freighting work on to a much more satisfactory and successful basis. A brief summary of the chief items of progress in the two directions mentioned develops the following general facts: Oil motors, using preferably light oils, like gasoline, have increased in favor over steam and electric motors for high-speed, long-distance, high-endurance vehicles. The greatest success with steam motors has been with heavy trucks and vans. The electric motor has given the best satisfaction when employed on vehicles for city cab and carriage work and short radius runs. When oil motors are employed the tendency is to increase the number of cylinders, four cylinders being commonly employed, of which two, three, or all four may be brought into play at will. This increase in power has been attended with comparatively little increase in weight, and weight has also been reduced by employing steel and

stamped forgings in place of heavier castings, and by improvements in water-jacket construction, which require a less weight of water to be carried for cylinder-cooling purposes. In the more recent oil motors the objectionable odor has been largely avoided by more perfect carburation and admixture of the richly carburetted air and supplementary pure-air admission, and by greater compression. In the mechanism for transmitting the power to the wheels, chains have been largely discarded for spur-gearing, especially in the heavier classes of vehicles. Compared with earlier practice, gears are now made with greater accuracy, of higher-grade material, and are hardened, and bearings are hardened, ground and perfectly machined. In tire construction the pneumatic tire occupies the first place in public favor, although solid rubber tires are largely employed. The following table shows the principal characteristics of a number of the leading English-built motor vehicles for freight service, tested at Liverpool in July and August, 1899:

NAME.	Wheels. Diameter, ins.	Lat. Dimen- sions, ft.	Boller press, lbs.	Engine horse- power.	Load, tons.	Weight, tons.
Thornycroft.....	33- 39	16 x6½	175	35	3.73	7.465
Thornycroft.....	34- 39	32½ x6½	300	40	4.09	8.430
Coulthard.....	33½- 35½	15.6 x6½	212	14	2.32	4.906
Leyland.....	36- 39	18.1 x6½	300	14	4.44	7.753
Clarkson.....	33- 41	17¾ x8.4	300	14	3.35	6.765
Bayley.....	32½- 35	16.4 x6½	300	22	3.67	7.282

Tests of these vehicles were made for control, manœuvring, hill-climbing, besides general economy, durability, and efficiency, and as the result of them the committee reported that: "The vehicles were suitable for trade purposes in Liverpool and neighborhood and merit recommendation to cart and team owners, and to others requiring to transport heavy loads." See FIRE PROTECTION; GARBAGE AND REFUSE COLLECTION.

AVEROFF, GEORGE, a Greek philanthropist, whose name in this country is known chiefly on account of his gift a few years ago of \$200,000 for the restoration of the Stadium at Athens, died August 3, 1899, in Alexandria, Egypt, at the age of sixty-nine years. He was born at Metsovo, Epirus, his real name being Avieros, but, having removed to Moscow when he was seventeen years old, he changed his name to the Russian form. He inherited from an uncle about half a million dollars, which fortune was greatly increased at the time of the Crimean war, when he supplied large amounts of provisions for the Russian troops. After the war he emigrated to Egypt. It is said that Averoff expended about \$7,500,000 in the erection of public buildings in Greece and in the maintenance of various charitable and philanthropic interests. His restoration of the Stadium at Athens was an important factor in the revival of the Olympic games. Averoff made the Greek navy heir to his fortune, the real estate of which was valued at about \$18,000,000.

AZORES, a group of islands in the Atlantic Ocean west of the kingdom of Portugal. Their area is 1005 square miles, and their population in 1890 was 255,594. Ponta Delgada in the island of San Miguel is the chief town, having a population of 16,769 in 1890, but the usual residence of the government is at Angra in the island of Terceira (pop. 11,067). The islands form a part of the kingdom of Portugal and send deputies to the Portuguese legislature. There is considerable trade in fruit, especially oranges, of which 40,000 boxes were exported in 1897 and 32,000 in 1898. In 1899 a new mail service was established between America and the Azores.

BACILLI. See BACTERIOLOGY.

BACTERIA. See MALARIAL FEVER; MILK; OSTREOTOXISMUS; PHOTO-THERAPY; PLAGUE; PSEUDO-INFLUENZA; SANITATION; SERUM THERAPY; SCARLET FEVER; YELLOW FEVER; SEWAGE PURIFICATION; SEWER GAS; WATER PURIFICATION.

BACTERIOLOGY. A minute bacillus was found in sewage by Klein last year, for which he proposes the name *bacillus pyogenes cloacinus*. The microbe was found to be pathogenic for animals, inoculation producing at times local abscesses, at other times general systemic disease.

Wassermann, of Berlin, discovered, in February, 1899, in the blood, in a case of acute articular rheumatism with chorea, a streptococcus capable of producing joint affections in animals. The microbic origin of chorea was suggested as a possibility by Dana, of New York City, about three years ago.

BADEN, GRAND DUCHY OF, a state of the German empire lying in southern Germany on the eastern bank of the Rhine.

Population, Religion, and Education.—The population, according to the census of 1895, was 1,725,464, an increase of 67,597 over 1890. About 54.7 per cent. of the



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AUTOMOBILES.—1. The "Royal Mail." Steam Van of England, as it appears in actual use. **2.** An English Steam Truck.

population were living in communities of less than 2000 inhabitants. The same census divided the population, according to religions, as follows: Catholics, 1,057,417; Protestants, 637,604; other Christian sects, 7480; Jews, 25,903. In the year 1895-96 there were in the public schools, gymnasia, and universities 347,327 students.

Finance.—The expenditure, according to the budget estimates for the year 1898, was 90,767,566 marks, and the revenue was 83,841,932 marks. Baden has no general debt, but its debt on the railways in 1898 was 329,029,252 marks, a decrease as compared with the preceding year. At the end of the year 1896 there were 1046 miles of railway in the country, of which 871 belonged to the government.

Government.—The chief magistrate is the Grand Duke. The legislature consists of a representative assembly of two chambers, the upper comprising princes of the grand ducal house, representatives of the nobility, the church, and the universities, and eight members nominated by the Grand Duke; and the second comprising 63 popular representatives chosen for four years, 20 for the cities and 43 for the rural districts. The Grand Duchy is represented in the *Bundestag* by 3 members, and in the *Reichstag* by 14 deputies. The reigning Grand Duke is Frederick I., who assumed the title on September 5, 1856. The Grand Duchess is the daughter of Emperor William I.

BADEN-POWELL, ROBERT STEPHENSON SMYTH, who became conspicuous in the Transvaal in 1899, was born on February 22, 1857. He was educated at the Charterhouse and joined the Thirteenth Hussars in 1876, and served in India, Afghanistan, and South Africa. In 1887-89 he served on staff as assistant military secretary in South Africa, and was mentioned in despatches for his operations in Zululand in 1888. He was also assistant military secretary in Malta in 1890-93; was on special service in Ashanti; and chief staff-officer in the campaign in Matabeleland, during which he was brevetted colonel and mentioned in despatches. In 1897 he was promoted to the command of the Fifth Dragoon Guards. Colonel Powell has written *Pig-Sucking or Hog Hunting*, 1889; *Reconnaissance and Scouting*, 1890; *Vedette*, 1890; *Cavalry Instruction*, 1895; *The Downfall of Prempeh*, 1896; and *The Matabele Campaign*, 1896.

Colonel Baden-Powell achieved great success at Mafeking in 1899 while commanding a comparatively small force. He resorted to many novel methods of defence and surrounded the town with a railway upon which he ran armored trains. See TRANSVAAL.

BAHAMAS, a British colony, comprise a chain of numerous islands and rocks lying off the southeast coast of Florida between 21° 42' and 27° 34' north latitude and 72° 40' and 79° 5' west longitude, and have an area of about 5450 square miles. Some twenty of the islands are inhabited, the population being in 1891 47,565, and in 1895 50,599. Of these about one-fifth are whites. The principal islands are New Providence, containing the capital Nassau, and having a population of about 11,000; Grand Bahama, San Salvador, Abaco, Harbor Island, Long Island, Eleuthera, Mayaguana, Acklin's Island, Exuma, Crooked Island, Watling's Island, Andros Island, Great Inagua. The government is directed by a governor, Sir Gilbert Thomas Carter, since 1897, who is assisted by an executive council of 9 members, a legislative council of 9 members, and a representative assembly of 29 members. The public debt in 1898 was £118,426. Other statistics of finance and statistics of commerce have been as follows:

	Revenue.	Expenditure.	Imports.	Exports.
1896.....	£65,126	£60,134	£194,774	£138,972
1897.....	62,754	63,405	186,010	149,085
1898.....	74,367	64,872	238,336	174,860

The tonnage entered and cleared in foreign shipping in 1897 was 518,217 tons. The chief industry is sponge-gathering, which produced in 1897 an export valued at £90,111, and in 1898 £97,512. Pearls, shells, and ambergris are also found. Fruit and sisal culture are increasing, under the latter there being at present over 20,000 acres. The export of pineapples in 1897 was valued at £24,581, in 1898 £24,360. The imports are chiefly food-stuffs, wines and spirituous liquors, hardware, and cotton, woollen, and silk fabrics. Statistics of education in the islands in 1897 were: 43 government schools, with an enrolment of 5777, and an average attendance of 3894; 31 Anglican schools, with an enrolment of 1771; 28 private schools, with an enrolment of 706; and 11 "aided" schools, with 958 pupils in attendance.

BAHR-EL-GHAZAL, one of the Soudanese provinces of Egypt which was cut off by the Mahdi's revolt, but regained as a result of the Anglo-Egyptian expedition in 1898. It is a well-watered country, and said to possess great natural resources, having an especial abundance of timber. The natives are largely Zandebs, a copper-colored race whose origin is uncertain. The population is variously estimated at from 1,500,000 to 2,000,000. Public attention was centred upon it in 1898 on account

of the conflicting claims of France and England arising out of the Fashoda affair. By the terms of settlement in the convention of March 21, 1899 (see FRANCE, paragraphs on History), it was included with the provinces admitted to be under British and Egyptian control. Its administration is provided for under the convention between Great Britain and Egypt of January 19, 1899, which places the territory along with the other Soudanese provinces under a governor-general appointed by Egypt with the assent of Great Britain. See EGYPT.

BAIN, THOMAS, a Liberal member of the Canadian House of Commons, was elected to the speakership on August 1, 1899, to succeed Sir James Edgar, who had died on the previous day. Mr. Bain was born in 1834 in Stirlingshire, Scotland; when he was three years old his family came to Canada, and settled on a farm in West Flamboro, Wentworth County, Ontario, where he was educated in the public schools and subsequently engaged in farming. He became a member of the town council, and in 1870 was made warden of Wentworth County. In 1872 he sat in Parliament, as a Liberal, for North Wentworth, which he thereafter represented continuously until 1896; since the latter year he has been returned by South Wentworth. Mr. Bain, who is the first farmer to be elected to the speakership, retired from farming in 1877 and has since lived in Dundas.

BAKER, LEWIS, journalist and politician, died in Washington, D. C., April 30, 1899. He was born in Belmont County, O., November 7, 1832. In 1853 he was editor of the Cambridge (Ohio) *Jeffersonian*; from 1863 to 1884 he edited the *Wheeling Daily Register*; the following year he bought the *St. Paul Globe*. He was elected, 1870, State senator in West Virginia. As a representative from Minnesota he sat in the Democratic National Convention of 1892; in the following year President Cleveland appointed him minister to Nicaragua, Costa Rica, and Salvador.

BALIZE. See BRITISH HONDURAS.

BALUCHISTAN, in the southern part of Central Asia, has an estimated area of 130,000 square miles, and an estimated population of 500,000, including both British and independent Baluchistan. British Baluchistan includes Quetta and Bolan, which are administered by British officials who represent the Khan of Khelat, and certain so-called assigned districts which are directly under British rule. Independent Baluchistan is under the government of the Khan of Khelat, who is the head of a confederacy of chiefs, but who is under British influence and acts upon the advice of a British agent. The territory of Baluchistan includes also the tribes of Afghans and Baluchs on the frontier. Quetta is the largest town, but Khelat is the capital. The prevailing religion is Mohammedan. The chief occupation is camel grazing. The chief exports are wood, hides, madder, dried fruits, bdellium, tobacco, and dates. Coal is found in several places and has been worked for some years at Khost. The Bolan and Sind-Pishin railways pass through the country under British jurisdiction, and surveys have been made for a line between Karachi and Quetta. The Khan is Mir Mahmud, who succeeded in 1893.

BAMBERGER, LUDWIG, a German politician and writer on history and economics, died March 14, 1899. He was born at Mentz, July 22, 1823; studied law in 1842-45 at Giessen, Heidelberg, and Göttingen. He took a lively interest in the political movement of 1848, and the following year joined the insurrection in the Palatinate. Upon the failure of this movement Bamberger fled, living thereafter in Switzerland, England, Belgium, Holland, and France. In 1866 he returned to Mentz, and two years later was elected to the customs parliament, and then to the *Reichstag*. Allying himself with the National Liberal party he set forth his free-trade principles with much oratorical skill; he took an active interest in the subject of currency reform. In 1881 he left the National Liberal party, establishing a group of secessionists; in 1884 he joined the German Liberal party, from which he withdrew in 1893. After this time he fought the policy of Bismarck, especially the latter's colonial schemes. Among Bamberger's more important works are: *Monsieur de Bismarck*, 1868; *Vertrauliche Briefe aus dem Zollparlament*, 1870; *Zur Naturgeschichte des französischen Kriegs*, 1871; *Zur deutschen Münzgesetzgebung*, 1873; *Die Zettelbank vor dem Reichstag*, 1874; *Reichsgeld. Studien über Währung und Wechsel*, 1876; *Deutschland und der Socialismus*, 1878; *Die Schicksale des latein Münzbundes*, 1885.

BANFFY, DESIDERIUS, Baron von, Hungarian statesman, resigned the premiership on February 26, 1899. The conflict over the provisional renewal of the *Ausgleich* having continued, Baron Banffy found himself the chief obstacle to reconciliation. Since, in the course of his administration, he had incurred the enmity of several of the factions, especially of the Clericals. Parties were divided over the *Ausgleich* question in the Hungarian Diet as they were in the Austrian *Reichsrath*, and the unpopularity of the Banffy ministry aggravated the matter. Banffy's resignation brought general relief. He was afterward appointed master of ceremonies at the

court. His legislative seat in the Hungarian Diet was occupied by M. d'Ugron, the chief of that group of the Left, which Baron Banffy had overthrown in the general elections of 1896. Though Baron Banffy became a member of the Chamber of Magnates, his resignation was interpreted by many as a virtual retirement from active political life, since his official position was henceforth of a rather ornamental or honorary character. He was born at Klausenberg, Hungary, in 1842, was educated at Leipsic and Berlin, and entered politics as a Liberal. In 1892 he became a member of the cabinet after the general elections, in which he had been chosen a representative from Transylvania. He won the favor of the court by absenting himself from the funeral services of Kossuth and, after the dissolution of the Weckerle-Szilagyi cabinet, he was chosen premier (1895). His popularity increased after his conflict with the Papal Nuncio and the resignation of Count Kalnoky. In 1896 the general elections gave his ministry an immense majority, but his course had offended the Liberal prepossessions of the members of the Diet and, during the latter part of his ministry, he was held in power merely by the unwillingness of the majority to withdraw from his support at the bidding of a factious minority. See AUSTRIA-HUNGARY (paragraphs on History).

BANK—BANKING. *Tendency of Modern Banking.*—An excellent account of the chief features in the evolution of modern banking was given by Mr. C. A. Conant in the *Political Science Quarterly* for December, 1899, and the mention of some of the points brought out in this article may be of present interest. The most conspicuous steps in the evolution of banking are stated in this article as follows: “(1) The predominance of bank-note issues in the early stages of modern banking; (2) the decline in the importance of such notes, as the mechanism of the check and deposit system has grown in favor; (3) the concentration of banking capital in great private banks and the loss of primacy by the national note-issuing banks, except as the custodians of the ultimate banking reserve in times of crisis; and (4) the growth of the principle of mutual support among the banks.” The nineteenth century has been the period during which the principles of banking have developed, for, while the Bank of England had previously supplied an important part of the medium of exchange in the seventeenth and eighteenth centuries, the following dates for the foundation of the other great banks of Europe show how recently present conditions were established: The Bank of France, 1800; National Bank of Austria, 1817; the Swiss Bank, 1836; National Bank of Belgium, 1850; Bank of Russia, 1860. While the principle of deposit banking was understood before the note-issuing function was operative, the issue of bank-notes greatly extended the system of deposit banking and introduced it where it could not otherwise have been employed. Wherever the bank deposit system has been highly developed the community has previously passed through a stage of bank-note issue. Note issues have furnished the necessary instruction in the principles of banking, and deposit banking would have been greatly retarded without them. The development of the deposit system in England and Scotland, for example, followed the issue of notes by the banks of those countries, and in France the departmental banks in the early part of the nineteenth century found their chief business in their note issues and discounts. In 1847 their current deposits were only 16,800,000 francs, while their note issues amounted to 90,100,000 francs, with a total capital of 23,400,000 francs. These notes were protected by a reserve in metallic money amounting to 41,700,000 francs. The great service which note issues render the community is the bringing into use of saved-up capital in an automatic and unconscious manner. The acceptance of these notes by business men is practically a loan of capital. The deposit system, on the other hand, attains this end by means of direct transfers of capital from the owners to the banks. In default of these means banks must resort to a high capitalization. This expedient has been followed in Germany, where the Imperial Bank and the state banks of issue have small deposits and a very restricted note circulation. Consequently German banks have greatly increased their capital, and a recent estimate shows that for 100 marks of capital in Germany there are only 50 marks in deposits, while in England there are 1207 marks in deposits. The capital and reserves of the German banks at the close of 1897 amounted to \$100,000,000 more than those of the British banks, while the deposit liabilities of the British banks were many times in excess. The result of this has been a stringency in the money market and a high rate of discount. The Imperial Bank, before the revision of its charter in 1899, could issue only \$73,000,000 in notes based on securities, all issues in excess of this to be covered by specie to the full amount, or to pay a tax of 5 per cent. per annum. The demand for currency has led to the constant increase of the taxed circulation, which rose to 172,000,000 marks at the end of 1897 and to a higher figure at the close of the succeeding year. The effect of the tax has been to cause an increase in the rate of discount.

Besides the bringing into use of saved-up capital, bank-notes perform another valuable function in economizing the precious metals. Again, there is a preference in many communities for paper notes. This is illustrated in France, where the notes of the Bank of France are issued to the amount of \$700,000,000, although they are covered to nearly 90 per cent. by specie reserves. In Austria also the same preference for bank-notes showed itself in 1892, when the government started to retire the notes for silver, but encountered a strong opposition on the ground of the superior convenience of the paper currency. There are many signs that point to the decrease in importance of the bank-note in present banking transactions. It has been pointed out that down to 1830 the Bank of England probably derived its main profits from its bank-note circulation. The limitations imposed upon note issues by the act of 1844 were sharply criticised, but it would seem that the people of England do not suffer from this restraint upon monetary circulation. This is due largely to the development of check and deposit system, which has provided an elastic currency and one whose efficiency is likely to increase as banking progresses. One of the signs of the times is the steady expansion of the discount and deposit system and the stationary or diminishing importance of bank-note circulation. The banks of England, France, and the United States have acquired such enormous reserves through the increase in their deposits and the transfer of deposits by checks is so generally practised that the demand for bank-notes and other forms of money is becoming more and more limited. Another tendency pointed out by the writer mentioned is the superior importance in respect to the volume of the transactions of private and state corporations as compared with the privileged national banks. While the national banks have been the real foundation of credit down to a recent date, their competitors, having a large capital of their depositors at their disposal, have steadily increased in importance, and at the present time the national banks cannot be regarded as the main dispensers of commercial credit. Their chief importance at this time consists in their serving as a reserve force. They form a reservoir of credit. The system of central reserve banks is one of the most striking features of modern banking. The central bank is less likely to be shaken in times of panic than the commercial banks, whose solvency is more closely connected with the financial reputation of their depositors. In order to secure this position of unquestionable credit, which it is essential that any central bank should hold, it was necessary to gain over public opinion, so that the notes of the bank would be as acceptable as metallic money. This has been done. The next thing was to secure the same confidence for the other forms of negotiable paper issued by the banks. Here the great national banks have rendered an important service by acting as the safeguards of credit in times of panic. Along with the development of the one reserve system or the system of central note-issuing banks, there has been a tendency for banks to unite and support each other in times of an emergency. Formerly banks did not yield this mutual support, and the present method has resulted in giving them a strength beyond anything that the older system could afford. The development of the Clearing House Association in the United States is an illustration of this. In Europe, where the banking systems are more concentrated, the clearing house has not been required. The manner in which the Clearing House Association came to the relief of the banks of the United States in 1893 is well known. The idea of the system is that the banks may maintain and expand their loans, that their specie should become a common fund, and that clearing-house certificates should be issued for the settlement of obligations between the banks instead of coin. The great banks in Europe have on several occasions come to the assistance of the smaller institutions in the same way as the Clearing House Association came to the relief of the banks in 1893. In France, for example, in the crisis of 1847, the Bank of France sold securities for gold to relieve the stringency. A better illustration, however, was that afforded by the crisis of 1890 in England, when, upon the failure of Baring Brothers and Company, with liabilities of about £30,000,000, the Bank of England provided for the meeting of all the liabilities of the failed corporation and accomplished this by forming a combination of the chief banking institutions in England, with the result that the panic was averted and that within three years the liabilities were reduced from £30,313,000 to £4,558,813. Thus the distinctive feature of modern banking is the centralization of credit and the formation of institutions which may be termed "bankers' banks." This has added greatly to the amount stored in the main reservoirs of credit. It is estimated that the gold reserves of European banks of issue nearly doubled in the twelve years following 1885, and between 1884 and 1898 it was said that these gold reserves had increased by \$1,000,000,000, while the circulation had increased only \$500,000,000. This increase is shared by the banks of all the leading countries, but Russia holds the first place, the gold reserve of the Bank of Russia having risen from 699,900,000 francs in 1883 to 3,095,400,000 francs in 1897. The following

table quoted from Mr. Conant's article shows the specie reserves and circulation in millions of francs from 1883 to 1897:

Year.	Gold Reserve.	Silver Reserve.	Circulation.	Per Cent. of Gold to Notes.
1883.....	3,555.9	2,049.9	12,246.9	29
1888.....	4,376.1	2,517.0	12,757.8	34
1890.....	4,592.7	2,339.2	13,205.8	35
1892.....	6,207.1	2,495.1	14,805.5	42
1894.....	6,952.0	2,603.7	15,539.5	45
1896.....	7,859.9	2,512.7	14,536.6	54
1897.....	8,745.6	2,556.4	15,282.4	57

The effect of the co-operation of the banks and the concentration of credit has been to render the banking credits as good a medium of exchange as gold and silver in advanced communities. A further effect has been to check the injurious results of panics and to prevent runs on the deposits of banks which are known to be sound. There have been many instances in recent years of a readiness to accept banking credits even in times of panic as freely as coin. The metallic basis of these credits will vary with the nature of the community, and cannot be determined on *a priori* principles. When the system is carried to such a point that banking credits shall have as complete a command over commodities as metallic money now possesses, the ideal qualifications of a currency will be attained. That there is a tendency in this direction appears from the banking history of the century. There is a greater security not only for bank-notes but for banking credits. Banks unite and accumulate their cash reserves in a central bank which can meet all demands upon it. There have been frequent incidents of an increase of deposits even in times of panic, since banking credits have been recognized as a safe means of storing circulating capital.

Concentration of Banking Capital.—Toward the close of the year 1899 much discussion was occasioned by the proposed increase of capital of two of the New York City national banks which would bring the capital in each case to \$10,000,000. Many spoke of an era of giant banks, when powerful institutions would gradually absorb or drive out competitors, and bring into the department of banking the same evils which were feared in the case of trusts in the industrial world. It was argued that these mammoth corporations would tend to concentrate too much power in the hands of individuals, and that this power would often be used unwisely and to the public detriment. That there is a tendency toward the concentration of large bodies of capital in the hands of single banking institutions cannot be doubted; but in spite of some conspicuous examples of this in 1899 the movement is by no means new. Nor has it been carried as far in this country as abroad. A capital of \$10,000,000 seems in fact a small matter in comparison with the capital and surplus of some of the great European banking corporations. The following are a few of the chief examples: Bank of England, capital and surplus \$88,500,000, deposits \$268,000,000; Imperial Bank of Germany, capital and surplus \$50,000,000, deposits \$150,000,000; Deutsche Bank (Berlin), capital and surplus \$52,000,000, deposits \$110,000,000; Bank of France, capital and surplus \$45,000,000, deposits \$100,000,000; National Provincial (Great Britain), capital and surplus \$25,000,000, deposits \$256,000,000; London City and Midland, capital and surplus \$22,000,000, deposits \$92,000,000. It is not strange that the movement toward consolidation, which is seen everywhere else in economic affairs, should manifest itself here. The greater economies and the better facilities for producing wealth afforded by concentration of capital in the industries may be attained by the same means in the sphere of finance. Much of the opposition to this movement springs from the same cause as the hostility to the old Bank of the United States, and is a manifestation of the spirit that led to the overthrow of that institution and the creation of the independent treasury of the United States. The experience of this country in the past has bred distrust of the banks, and this often shows itself in the form of opposition to the enlargement of banking functions to meet well-recognized evils in the currency system.

Banking Reform.—The reform of the banking system of the United States with a view to securing greater elasticity of the bank-note circulation is an important part of the currency reform movement, and a discussion in detail of the banking features of the various currency bills that were before the public in 1899 is given in the article CURRENCY REFORM (*q. v.*) The present article deals only with some of the general arguments for banking reform which have been added to those already included in the YEAR BOOK for 1898, and especially such as have been advanced in the secretary of the treasury's annual report, published in December, 1899, and the comptroller

of the currency's report for the fiscal year ending June 30, 1899. These arguments, as representing the conservative views of government officers of experience, have an especial interest. In the first place it is argued that Congress, under the present banking system, necessarily has assumed a large responsibility for the working of the banks. The great object now in view is to secure a flexible currency without impairing in any way its stability. There is reason to believe that this can be done. Some plan must be devised for giving to the banks, under proper limitations, the power of expanding the currency when necessary. Such a power is at present possessed by them in regard to that large portion of the currency which consists of credits. It is well known that the volume of checks and drafts and the interchange of credits between the bank and its dealers make up the bulk of currency, and that money in the sense of gold and silver forms but a small fraction of the actual circulating medium. It is estimated by the secretary of the treasury, for example, that the total money of the country, metallic and paper, is less than \$2,000,000,000, while the deposits of the banks, commercial, state and national, amount to more than \$4,000,000,000. Against this amount of deposits there are checks and drafts each month amounting to over \$8,000,000,000; thus the cashing of these obligations in one-half month suffices to exhaust the entire deposits. But these drafts and credits do not, of course, represent a demand for actual money. They represent merely a transfer of property and credit. Yet they perform an enormous part of the money work, insuring the passage of goods from hand to hand and the settlement of trade accounts. The importance of the function which credit plays in the complex industrial world of to-day can hardly be estimated. The principle of it is fully recognized, and it forms the foundation of by far the greatest portion of modern industry. Under normal conditions there is a satisfactory adjustment of the currency supply to the demand. Bank credits, together with checks and drafts, are sufficiently flexible and responsive to the ordinary changes in the market, but a period regularly occurs in each year when they do not perform the required service. This is at the season when the crops are to be harvested and the cost of labor to be paid. At this season there is a demand for a form of credit which is at once convenient and universally acceptable. Checks and drafts will not suffice on account of the limited spheres in which they are accepted. Cash or paper money is needed at this time. Now, the banking reformers ask why the banks cannot be provided with the means of expanding their circulation at this season. The secretary of the treasury says that, apart from the safety of the note-holder, "it is impossible for any one to name a good reason why the indebtedness of the banker in this field of the exchanges should not be expressed as freely in his notes of hand of convenient size as in one consolidated entry to the credit of his dealer upon his books of account." The severe restraint imposed upon the circulation of national banks and the tax of 10 per cent. upon the notes of state banks prevent the issue of notes to meet these needs, even though the bank balances are in every way adequate for the purpose. The secretary gives the following illustration of this regularly recurring stringency. On August 26 the deposits of the banks of New York amounted to \$858,000,000. Their outstanding loans were \$756,000,000. Their holdings in cash were \$227,000,000. These figures seem to show a satisfactory relation to one another and the reserves appeared to be ample. But the demand for money to meet the expenses of crop gathering now made itself felt. Bankers and merchants having credit balances in the books of the New York banks required currency to meet this demand. Under the system which the banking reformers advocate, the New York banks in these circumstances could have issued their notes in the form of paper money and satisfied the needs of these merchants and bankers. In other words, the credit of the banks would have merely assumed a different form, the book credit being cancelled to the amounts of the notes issued and deposits diminished by so much as the circulating notes increased. The reserves would have remained unchanged and there would have been no alteration in the loan and discount market. Instead of this the banks had to meet this demand by resorting to their cash reserves, and between August 26 and October 14, \$23,000,000 were taken from this fund. This inroad on the reserves prevented the banks from performing their main function—that is, the exchange of credit—and obliged them to prevent the further reduction in their holdings of cash by collecting claims and reducing their credit obligations. The general result was that bank credits fell off within a period of nine weeks to the extent of \$84,000,000. It is to meet such difficulties as this that the various banking reform schemes have been devised. Appeal has been made to certain foreign systems of banking and to systems which have been employed with success in the United States—namely, the New England system and that of New York, Ohio, Indiana and Louisiana. The following points which the secretary mentions as requiring amendment are noticed in most of the currency schemes for reforming the banking system: In the first place it is argued that the requirement of a minimum of capital of \$50,000

as a precedent to the organization of a national bank is excessive, and that in small communities the minimum should be reduced to \$25,000. Secondly, there should be a change in the law regulating the note-issuing function, with a view to extending it so far as is consistent with safety. Thirdly, the limitation upon the loans which any bank may make to a single individual, firm or corporation is said to work with great inequality. Finally, there should be a reasonable relation established between the bank's capital and its ultimate liability. Liability is as fit a subject of legislation as cash reserves. The capital of the bank is the proper guarantee for its solvency as to its deposits. As to the improvement of the note-issuing function, a common feature of most banking provisions of the currency reform measures is the establishment of an emergency circulation. This is urgently advocated by the comptroller of the currency in his annual report. Such an emergency circulation should come into use at those seasons of the year when the gathering of the crops increases the money demand in the manner above indicated, and in general at all times when a tendency toward a financial panic manifests itself. A period of prosperity and of active trade such as the years 1898 and 1899 illustrated was considered a very favorable time for the introduction of this reform. It is argued that the panic of 1893 showed the need of such an emergency circulation. The comptroller illustrates this by the following figures: Between May 4 and October 4, 1893, national bank deposits fell off \$378,767,691; the deposits with other banks fell off \$51,198,856; stocks and securities fell off \$2,177,912. To meet the demand upon them the banks took out a new circulation of \$31,265,616 and borrowed \$36,615,092. But the delay incident to the printing of bank-notes, amounting on the average to 25 days, prevented a large part of the notes which were ordered from being actually circulated. Orders for some \$11,000,000 worth of notes were cancelled. In spite of the issue of notes and the borrowing, the banks had to contract their loans by \$318,767,691. This shows that an emergency circulation would have been needed only for a short time, that it would have lessened the injurious effect of the panic, and that it would not have remained long after the crisis had passed. The comptroller, in common with many others, has recommended that, in order to protect the banks in the community in times of panic, they should be allowed to issue a small amount of uncovered notes in addition to the secured notes, but that this excess should be so heavily taxed that it would not be issued in normal times, but only in times of emergency. The tax would cause the rapid retirement of the notes after the emergency was passed. At the same time it would provide a fund out of which the notes of insolvent banks could be redeemed. The problem of providing a secure and elastic system for the 3600 national banks now in existence is, of course, a difficult one, but even on the principle of bond-secured bank-notes, which is now in force, it would be possible to introduce greater elasticity. The change proposed to this end is that banks shall be allowed to issue notes to the par value of the United States bonds, instead of to 90 per cent. of the par value, as at present. The comptroller's recommendations are as follows: That national bank notes be issued to the par value of the United States bonds, and that the additional 10 per cent. of circulation thus allowed be subject to a tax of 2 or 3 per cent. per annum; that the present tax of 1 per cent. on the circulation be abolished or reduced. The tax of 2 or 3 per cent. upon the 10 per cent. increase of circulation would prevent its being taken out at normal times for profit and save it as an emergency circulation. The following is a brief summary of his views. Even though the provision for an uncovered emergency circulation be not made, there is a means of providing a greater degree of elasticity with a bond-based currency by allowing the national banks to issue notes to the par value of the bonds, subject to a tax of 2 or 3 per cent. He would then abolish or lower the present 1 per cent. tax on circulation with the object of securing an increase in the present issues. He argues that "without any general increase in bank-note circulation, as a result of new legislation, the possible emergency circulation of \$20,000,000 immediately available, based on bonds securing the present circulation, amounts to more than the combined bills payable and rediscounts of all the national banks of the United States outstanding at any time within the last three years."

As to the limitation of loans the comptroller recommends a modification of the law limiting certain loans to 10 per cent. of the capital of the bank. The law should be so changed as to prevent the defective and unequal working of the present provision. See CURRENCY REFORM.

As noted in the 1898 YEAR BOOK, the amount of national bank-notes in circulation has considerably increased since the summer of 1893, when the amount outstanding was \$177,164,255 on June 1. At the end of 1896 the total national bank-notes outstanding were \$235,398,890. There was a gradual decrease until April, 1896. During the rest of 1896 they gradually increased, amounting on October 1

to \$235,356,950. During the year 1899 the increase continued, and on October 31 of that year they aggregated \$243,066,624.

The following report of the comptroller of the currency in 1899 gives the assets and liabilities of national banks and other banking institutions in the United States reporting on June 30, 1899:

	3,588 National Banks.	6,149 Other Banks.	9,732 Banks.
Loans.....	\$2,507,954,980	\$2,659,940,630	\$5,167,895,610
United States bonds.....	846,114,418	173,978,788	530,088,151
Other bonds.....	305,428,927	1,353,321,428	1,659,050,349
Cash.....	512,414,941	210,594,047	723,296,988
Capital.....	604,865,327	308,746,048	973,611,975
Surplus and profits.....	842,321,753	418,738,087	701,119,839
Deposits.....	2,522,167,509	4,946,500,852	6,708,658,361
Total resources.....	4,708,683,904	5,196,177,351	9,905,011,285

The following table shows the population of the different sections of the United States on June 1, 1899; the aggregate capital, surplus, undivided profits, and individual deposits of national banks, etc., on or about June 30, 1899; the average of these items per capita, and the per capita averages in each class of banks and in all banks:

SECTIONS.	Population June 1, 1899.	ALL BANKS.		AVERAGE PER CAPITA.				
		Capital, etc.	Average, per Capita.	National Banks.	State Banks.	Loan and Trust Companies.	Savings Banks.	Private Banks.
New England States.....	5,465,000	\$1,721,281,992	\$314.96	\$104.40	\$2.57	\$38.84	\$174.15	.....
Eastern States.....	16,943,000	3,964,025,968	233.96	90.18	25.90	49.86	67.89	\$0.73
Southern States.....	21,865,000	488,039,306	22.30	12.58	8.85	.....	.52	.25
Middle States.....	23,837,000	1,670,419,048	70.08	35.39	26.50	.67	4.95	2.57
Western States.....	5,041,000	200,882,255	51.75	32.08	19.30	.....	.....	.37
Pacific States.....	3,115,000	407,661,580	130.87	81.54	46.12	.....	58.40	.81
Total, United States.....	76,966,000	\$8,512,300,108	\$111.61	\$45.59	\$19.81	\$13.71	\$31.40	\$1.10

BANKRUPTCY. See UNITED STATES.

BAPTISTS, next to the Roman Catholics and the Methodists, the most numerous of the Christian churches in the United States, comprise (1) the Regular (North), with 5409 ministers, 9020 churches, and 971,671 members; (2) the Regular (South), with 9000 ministers, 18,873 churches, and 1,615,000 members; (3) the Regular (Colored), with 14,000 ministers, 15,000 churches, and 1,555,324 members; (4) the Six Principle Baptists, with 14 ministers, 18 churches, and 937 members; (5) the Seventh-Day Baptists, having 135 ministers, 114 churches, and 9161 members; (6) the Free-Will Baptists, reporting 1312 ministers, 1517 churches, and 85,242 members; (7) the Original Free-Will Baptists (not reported for 1899), but having in 1898 120 ministers, 167 churches, and 12,000 members; (8) the Separate Baptists, with 113 ministers, 103 churches, and 6479 members; (9) the General Baptists, with 450 ministers, 550 churches, and 27,500 members; (10) the United Baptists, not reported in 1899, but in 1898 having 25 ministers, 204 churches, and 13,209 members; (11) the Baptist Church of Christ, with (in 1898) 80 ministers, 152 churches, and 8254 members; (12) the Primitive Baptists, with 2130 ministers, 3530 churches, and 126,000 members (1898), and (13) the Old-Two-Seed-in-the-Spirit-Predestinarian Baptists, with 300 ministers, 473 churches, and 12,851 members. The total number of Baptists in the United States in 1899 was 4,443,628, an increase of 89,201 for the year, with 33,088 ministers and 49,721 churches. The Regular Baptists (North) held a conference at Philadelphia in February. The year was particularly marked by the installation of several presidents in Baptist institutions of learning, notably Brown University. The Colored Baptists have established missions in British East Central Africa and in Cuba. The latest report (1899) of the commissioner of education shows that the Baptists have 54 institutions of learning, with 805 professors, 7223 students, and endowment funds aggregating \$14,590,308.

BAPTIST YOUNG PEOPLE'S UNION OF AMERICA, organized in 1891, and made up of young people's societies in Baptist churches in the United States and Canada. President, John H. Chapman, Chicago; secretary, Rev. E. E. Chivers, D.D., 324 Dearborn Street, Chicago, Ill.

BAR ASSOCIATION, AMERICAN, formed in 1878, held its twenty-second annual meeting at Buffalo, N. Y., August 28-30, 1899. The president's address was delivered by the Hon. Charles F. Manderson, acting president in the absence of Ambassador Choate; the annual address, by Senator William Lindsay, of Kentucky; a paper on New Jersey and the Great Corporations, by Edward Q. Keasbey, of New Jersey, and a paper on the State Punishment of Crime, by Sir William Rann Kennedy, justice of the English High Court of Justice. The association comprises about sixteen hundred of the leading members of the bar in the United States, subdivided into committees, whose principal work includes the reorganization of the federal and judicial system, the adoption of uniform State laws on various subjects, the elevation of the standard of legal education, some amendments of the patent, trade-mark, and copyright laws, etc. President, Senator Charles F. Manderson, Omaha, Neb.; secretary, John Hinkley, 215 N. Charles Street, Baltimore, Md.

BARBADOS, a British colony, is an island, lying east of the Windward Islands, having an area of 166 square miles and a population of about 190,000. The seat of government is the port Bridgetown, having a population of about 21,000. The government is directed by a governor, Sir James Shaw Hay, since 1892, who is assisted by an executive council, an executive committee, a legislative council of nine members, and an elective assembly of twenty-four members. The public debt in 1898 was £414,000. Other statistics of finance and statistics of commerce have been:

	Revenue.	Expenditure.	Imports.	Exports.
1896.....	£176,932	£184,020	£1,048,887	£758,228
1897.....	184,606	172,551	1,008,699	736,163
1898.....	182,682	185,840	1,058,885	769,231

Of the trade of 1898 the value of imports from Great Britain was £428,063, and of exports to Great Britain, £35,207. The total tonnage entered and cleared, foreign shipping, was in 1897, 1,335,962 tons.

The acreage of the island is something more than 106,000, of which about 100,000 acres are under cultivation, about 30,000 acres being under sugar culture, the chief industry. The other chief exports are molasses and rum, and the principal imports are textiles, rice, salted meat, and other provisions. The sugar yield amounted to 36,451 hogsheads in 1895, 49,399 hogsheads in 1896, 58,600 hogsheads in 1897. The export of manjak, a bituminous petroleum fuel, in 1897 was 1880 tons, valued at £3760. The value of the fish catch is about £17,000 annually. The registered shipping of Barbados in 1897 comprised 50 vessels, 48 sail and 2 steam, having a total tonnage of 7105 tons net. There are 470 miles of roads, 24 miles of railway, and 24 miles of telegraph and 635 miles of telephone lines. The Colonial Bank has a paid-up capital of £600,000; deposits in the Government Savings Bank on December 31, 1898, amounted to £218,573.

Religious statistics in 1891 were: Church of England, 156,539; Wesleyans, 14,485; Moravians, 6801; Roman Catholics, 816; Jews, 21. An annual legislative grant of £11,220 is made to the religious bodies and apportioned as follows: Church of England, £10,070; Wesleyan, £700; Moravian, £400; Roman Catholics, £50. Education, which is under government direction, is in a very good condition; the yearly government grant for public instruction is about £11,500. Besides schools for secondary and higher education, there were in 1897, 179 primary schools, with an average attendance of 15,556 pupils. There are published on the island three daily, two weekly, two bi-weekly, and two monthly papers. Barbados is the headquarters of British troops in the West Indies; the garrison comprises about 850 officers and men.

On September 10, 1898, a terrible hurricane swept over the Lesser Antilles, doing great damage, especially in Barbados, St. Vincent, St. Lucia, St. Kitts, Nevis, Montserrat, the Grenadines, Anguilla, Barbuda, and Trinidad. In these islands many hundreds lost their lives and thousands were left homeless and destitute. In Barbados the houses of 11,426 laborers were demolished and 4918 were damaged. Aid was rendered by the imperial authorities. The great West Indian hurricane of August 7 and 8, 1899, touched Barbados, but was not as disastrous to this island as was the former. During 1899 relief measures on the part of the imperial government for the improvement of West Indian industries and commerce were being carried into effect; one of the measures was a loan of £120,000 for the establishment of central sugar factories in Barbados. For a further account of the matter see **WEST INDIES**.

BARBER SHOP. See HYGIENE.

BARITES. The production of barites in 1898 amounted to 29,306 short tons, value \$108,339, as against 26,002 tons, value \$58,295, in 1897, an increase of about 25 per cent. Barite is used as a substitute for white lead in the manufacture of paints. The chief source of supply is Missouri, where the material occurs in veins, and more or less stained with iron. In the process of preparation for market the barite has to be ground very fine, then boiled in sulphuric acid, to remove the iron stains, after which it is washed to remove the acid. The ground and purified product is then separated by the process of filtration in water, the very fine particles being carried off in suspension, and forming first grade, while those which settle rapidly form the second grade of the product. As an adulterant of white lead it is practically harmless, and possesses the advantages of being not only cheaper, but also not being affected or discolored by acid vapors that may be in the atmosphere.

BARLEY The following table, published by the department of agriculture, division of statistics, shows the acreage, production, and value of barley in the United States in 1899:

STATES AND TERRITORIES.	Acreage.	Average yield per acre.	Production.	Average farm price Dec. 1.	Farm value Dec. 1.
	<i>Acres.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Cents.</i>	<i>Dollars.</i>
Maine.....	11,988	29	347,652	59	205,115
New Hampshire.....	4,620	26	115,500	65	75,075
Vermont.....	17,384	31	538,904	52	280,220
Massachusetts.....	1,695	30	50,850	68	34,578
Rhode Island.....	815	29	9,185	70	6,394
New York.....	166,853	24	4,052,472	50	2,026,236
Pennsylvania.....	8,564	31	179,844	49	88,124
Texas.....	1,970	18	35,460	66	23,404
Tennessee.....	1,779	11	19,569	64	12,524
Kentucky.....	1,381	21	29,001	43	12,470
Ohio.....	21,550	28	603,400	45	271,530
Michigan.....	88,681	24	927,144	48	445,029
Indiana.....	6,182	25	153,300	45	68,965
Illinois.....	13,638	29	395,502	47	185,686
Wisconsin.....	255,685	30	7,670,550	40	3,068,220
Minnesota.....	825,765	25	8,144,125	31	2,534,679
Iowa.....	461,996	26	12,011,896	31	3,723,688
Missouri.....	730	18	12,960	42	5,443
Kansas.....	187,245	17	3,183,165	27	859,455
Nebraska.....	36,276	26	943,176	30	282,953
South Dakota.....	104,706	23	2,410,854	29	699,003
North Dakota.....	246,223	24	5,909,352	33	1,950,086
Montana.....	6,183	25	116,405	51	110,367
Colorado.....	12,069	28	337,932	55	185,863
New Mexico.....	1,109	32	35,488	61	21,648
Utah.....	5,905	33	194,865	52	101,330
Idaho.....	11,586	35	405,510	46	186,535
Washington.....	40,296	35	1,410,860	44	620,558
Oregon.....	28,497	29	797,916	50	398,956
California.....	855,376	26	22,239,776	50	11,119,888
United States.....	2,878,229	23.5	73,381,568	40.3	20,594,254

BARNARD, GEORGE GREY, American sculptor, born in Bellefonte, Penn., May 24, 1863, received his training at the Chicago Art Institute, and in 1884-87 studied at the École National des Beaux Arts, Paris. He attracted attention at the Paris Salon, and, returning to America, exhibited his works in New York. His "God Pan" was placed in Central Park; "Two Natures" in the Metropolitan Museum, and his "Brotherly Love" is in Norway. In 1899 he finished "The Hower," which is one of a proposed colossal group destined to stand in a vessel that is to represent the ship of life.

BAR OF THE CITY OF NEW YORK, THE ASSOCIATION OF THE, organized in 1869 and incorporated in 1871, was "established to maintain the honor and dignity of the profession of the law, to increase its usefulness in promoting the due administration of justice, and to cultivate social intercourse among its members." It owns and occupies a commodious building at 42 West Forty-fourth Street, New York City, and possesses a law library of 51,454 volumes, at a cost of \$178,557.48. The admission fee is \$100; annual dues, resident members, \$20 to \$40; non-resident members, exempt. The last report showed 1441 resident members, 114 non-resident members, and 22 honorary members. President, James C. Carter; corresponding secretary, B. Aymar Sands; librarian, William F. Kip.

BARON DE HIRSCH FUND of \$2,500,000, given by the late Baron Maurice de Hirsch, for the aiding of Russian and Roumanian Jewish immigrants. The

committee intrusted with the administration of the annual income of this fund, which amounts to \$100,000, provides for the reception of immigrants, their instruction in the English language and mechanical education, and advises them as to acquiring rural homes, grants, loans, etc. Six hundred Jewish families have been settled on New England farms and 400 in New Jersey. The Woodbine Agricultural and Industrial School, New Jersey, has now 69 pupils. In co-operation with the Baron de Hirsch fund is the Jewish Colonization Association, which was founded by Baron de Hirsch. See HIRSCH, CLARADE DE.

BARRETT, JOHN, former United States minister to Siam, was born at Grafton, Vt., November 28, 1866. After his graduation at Dartmouth College, in 1889, he went to the Pacific coast and taught for a term in Hopkins Academy, Oakland, Cal. He then engaged in journalism in Tacoma, and later in Portland, where he was associate editor of the *Evening Telegram* until 1893. In the previous year Mr. Barrett was a delegate to the national Democratic convention in Chicago. In 1894 he was appointed minister resident and consul-general at Bangkok, Siam, where he remained until 1898. From May to September of the latter year he was a correspondent at Manila for New York, Chicago, and San Francisco papers. In 1899 he published a number of articles on the Philippines advocating the retention of the islands and the establishment there of American authority.

BASEBALL. Public appreciation of baseball, as relating to the game played by the league clubs of the country, continues to decline. There is a growing realization of the killing effect of paid professionalism on the spirit of the game, and the mismanagement and discord in league councils, together with the disgraceful rowdiness of many of the players, has cost league baseball the support of thousands of admirers of the sport. "Syndicate" ownership of certain clubs and too large a circuit in some of the leagues are assigned as causes of popular dissatisfaction. As the remedies suggested look mainly toward the increase of financial profits, there is little hope of an improvement in the spirit of the game. Late in 1899 the new American League threatened to supersede the National League in the management of the major clubs. Brooklyn won the National League championship of 1899 with 101 victories and 47 defeats, 68.2 per cent.; second, Boston, 95 victories; third, Philadelphia, 94 victories. Among the minor clubs, Indianapolis won the Western League championship and Rochester that of the Eastern League. The East defeated the West in the intersectional campaigns, 284 aggregate victories to 206. The intercollegiate series between Harvard, Yale, and Princeton, the most prominent university teams, was won by Princeton. Other Eastern college teams which played successfully were: Pennsylvania, Virginia, Lafayette, Manhattan, Cornell, Brown, Georgetown, and Holy Cross. The amateur campaign in the South and West showed an increasing development among the college teams.

BASUTOLAND, a British colony in South Africa, lying to the northeast of Cape Colony, and having an estimated area of 10,293 square miles and an estimated population, in 1896, of 250,000. The chief town is Maseru, with a population of 862, of whom about 100 were Europeans. It is well-watered and fertile, and is especially adapted for the production of grain. Its chief products are wheat, wool, mealies, and Kaffir corn. Coal is worked, and there are signs of copper and iron. The exports are chiefly grain, cattle, and wool. The foreign trade is with Cape Colony and the Orange Free State. The colonial government has done much recently to promote education and to extend and improve the roads. The revenues have advanced slowly but steadily since 1891. There is telegraphic communication with Cape Colony and postal communication with Cape Colony and the Orange Free State. The colony is governed by the resident commissioner (Sir G. Y. Lagden in 1899), who is under the direction of the high commissioner for South Africa. In 1898-99 the government granted in aid of education the sum of £4449. Nine-tenths of the scholars, who numbered 9714 at a recent enumeration, are in the schools of the French Protestant Mission. The revenue is obtained from the contribution of Cape Colony and from the post-offices, the native hut tax, and the sale of licenses. The European inhabitants number about 600. The prosperity of the colony has been checked of recent years by the ravages of the rinderpest. Internal disturbances have also retarded development. In February, 1898, the colonial authorities put down a revolt of natives and captured the leaders. During the rest of that year and the following year a fair degree of order was maintained, and, in spite of the Transvaal war and the proclamation of the Orange Free State annexing the northern part of the colony, the Basutos remained quiet. A meeting of the native chiefs was called in October in view of certain supposed attempts of the Boers to enlist their aid, and a pledge was given that the nation would remain loyal to the British government.

BATHS, MUNICIPAL. See MUNICIPAL BATHS.

BAUXITE. See ALUMINUM.

BAVARIA, a kingdom of southern Germany, forming part of the German empire, has an area of 29,286 square miles and a population (1895) of 5,818,544, of whom 4,112,623 were Roman Catholics, 1,640,133 Protestants, and 53,750 Jews.

Production.—The chief crops are rye, oats, barley, wheat, potatoes, and hay. Fruits, vegetables, and tobacco are also produced. The cultivation of the vine is an important industry. The production of wine in 1896 was 1,288,578 hectolitres, and in 1897, 521,524 hectolitres. Beer brewing is still more important. In Munich alone there are 25 breweries, which, between July 1, 1897, and July 1, 1898, turned out 71,095,395 gallons. It is estimated that Munich exports to other parts of Germany and to foreign countries about 25,000,000 gallons.

Finance.—The chief sources of revenue are the railways, posts, telegraphs, mines, etc., indirect taxes, state domains, direct taxes and fines, etc. The chief branches of expenditure are the cost of administration, contribution to imperial expenditure, and the service of the public debt. The public debt at the end of the year 1897 was 1,415,219,964 marks. Of the 3908 miles of railway, 3335 belong to the state.

BAXTER, ELISHA, ex-governor of Arkansas, died at Batesville, Ark., June 2, 1899. He was born in Rutherford County, N. C., September 1, 1827; was educated in the public schools of his county, and when a young man removed to Arkansas and became mayor of Batesville in 1853. He served in the State legislature in 1854 and in 1858. After the outbreak of the Civil War he entered the Union service, and in 1863 was promoted to the colonelcy of the Fourth Arkansas Mounted Infantry. At the close of the war he was elected to the United States Senate, but was not allowed to take his seat, as Arkansas had not yet been legally reconstructed. From 1868 to 1872 he was judge of the third judicial district. In the spring of the latter year Baxter was nominated for governor by the administration, or Grant, wing of the Republican party. The contest between him and Joseph Brooks, the candidate of the Liberal, or Greeley, wing, who also was largely favored by the Democrats, was one of the most bitter in the history of the State. Baxter was declared elected, but the Brooks party, alleging fraud, took the matter to the legislature, and later to the State Supreme Court. Brooks finally obtained a judgment against Baxter, and attempted forcibly to eject him from office. The quarrel spread to the adherents of both men, and bloodshed was prevented only by the presence of federal troops. Both parties appealed to President Grant, who decided in favor of Baxter, the decision, however, not being rendered until May, 1874. In the fall of that year Arkansas adopted a new State constitution, which reduced the gubernatorial term from four to two years; soon after, therefore, Baxter retired from office. In a message to Congress, February 8, 1875, President Grant stated that he had finally come to believe that Brooks, and not Baxter, had been chosen by the electorate.

BEAUFORT, Eighth Duke of, HENRY CHARLES FITZROY SOMERSET, K.G., died April 30, 1899. He was born February 1, 1824, and was educated at Eton. From 1846 to 1853 he was member of Parliament for East Gloucestershire. In 1858 he entered the British army as a lieutenant-colonel, and retired in 1861. His son, the Marquis of Worcester, succeeded to the title.

BEAUREPAIRE, QUESNAY DE. See QUESNAY DE BEAUREPAIRE.

BECHUANALAND. See RHODESIA.

BECQUE, HENRI FRANÇOIS, French dramatist, died May 2, 1899. He was born in Paris, April 9, 1837. In 1867 appeared his first dramatic work, *Sardanapale*, a libretto for which Victorin de Joncières wrote the music. In the following year the drama *L'enfant prodigue* appeared, and in 1870 his five-act socialistic play, *Michel Pauper*. The play attracted scarcely any notice at the time on account of the popular interest in the war, but when, in 1886, it was presented again, it evoked but little praise. Becque, who was a pioneer in the field of the realistic drama, brought out *L'Enlèvement*, which also failed to receive popular applause. Disappointed at these failures, he turned his attention to the work of lighter comedy, and in 1878 published *La navette*, and two years later, *Les honnêtes femmes*, which plays improved his reputation. In 1880, however, appeared his *Les Corbeaux*, a dismal drama of family life, which received much condemnation, but which served to fix his position as an innovator. *La Parisienne* appeared in 1885. Becque's other writings include *Théâtre complet*, two volumes, 1890; *Querelles littéraires*, published about the same time, and various newspaper and magazine contributions on subjects of the theatre, literature, and art.

BECQUEREL RAYS. See PHYSICS.

BEHRING SEA. See SEALING.

BELGIUM, a kingdom of western Europe, has an area of 11,373 square miles and a population on December 31, 1897, of 6,586,593, giving a density of 579.1 persons per square mile. A later estimate, December 31, 1898, gives the population at

6,669,732, or 586 to the square mile. There are 3,343,542 females and 3,326,190 males. According to the census returns of 1890, there were 2,485,072 who could speak French only and 2,744,271 who could speak Flemish only. Nearly the whole population professes the Roman Catholic faith, the Protestants numbering about 10,000 and the Jews 4000. The capital is Brussels, with a population on December 31, 1897, of 551,011, including the suburbs. Other cities over 100,000 population are Antwerp, Liège, and Ghent.

Government.—Belgium is a constitutional, representative, and hereditary monarchy. The constitution, dating from 1831, vests the legislative power in the king, the senate, and the chamber of representatives. All the representatives and the majority of the senators are elected directly by the people, the former for four years and the latter for eight years. A portion of the senators (26 out of 102) are elected indirectly by the people—that is, by the provincial councils. The law of September 7, 1893, introduced the principle of plural voting, as described in a subsequent paragraph. In 1897 the united constituencies numbered 1,407,000 voters, with 2,170,000 votes.

Finance.—In 1898 the total ordinary revenue was 388,298,598 francs and the total ordinary expenditure, 385,278,702 francs. The budget for 1899 estimated the total revenue at 435,037,428 francs. In 1898 the national debt, which consisted of a share of the Netherlands debt at 2½% and loans at 3%, amounted to 2,566,593,476 francs.

Shipping, Post-offices, and Telegraphs.—In 1898 the merchant marine in Belgium consisted only of 66 vessels and about 600 fishing-boats. Most of the carrying trade was in the hands of foreign vessels. On December 31, 1897, the total tonnage of vessels entered and cleared in Belgian ports was 15,899,475. The working of the post-office in Belgium was in 1897 as follows: Private letters, 117,848,690; printed matter, 96,456,423; newspapers, 110,587,241; postal-cards, 49,420,449, and official letters, 23,145,817. On January 1, 1897, there were 893 post-offices and 1026 telegraph offices. The total length of public telegraph lines was 3955 miles and the length of wires was 41,895. In 1898 the railway mileage open for traffic was 2850, of which 2057 was the property of the state.

Commerce.—In 1897 the general imports amounted to 3,090,829,820 francs and the general exports to 2,837,271,890 francs, a considerable increase over the preceding year. In 1897 Belgium exported to Germany goods to the value of 363,254,000 francs; to France, 297,938,000 francs; to Great Britain, 302,085,000 francs; to the Netherlands, 184,083,000 francs, and to the United States, 60,436,000 francs. The value of its imports from these countries in the same year was from Germany 233,972,000 francs; from France, 296,583,000 francs; from Great Britain, 275,566,000 francs; from the Netherlands, 159,271,000 francs, and from the United States, 231,743,000 francs. The chief articles of export were yarns, linen, wool, etc., coal and coke, cereals, textiles (raw), machinery, carriages, glass, iron, chemicals and drugs. The general articles of import were classified under the heads of cereals, textiles (raw), chemicals and drugs, timber, etc. The figures showing the value of imports and exports for the entire year were not available in 1899, but the following statistics, published in the United States Consular Reports of September, 1899, compare the first five months of that year with the year just preceding. The imports during the first five months of 1898 were \$152,427,540, and during the same period of the year 1899, \$159,790,490, an increase of about five per cent. The exports for the first five months of 1898 were \$125,478,564, and for the same period of 1899 \$128,342,491, an increase of two per cent. The customs duties during the first five months of 1899 amounted to \$3,856,182, an increase of about \$215,000 as compared with 1898. In the first five months of 1898 the number of vessels entered was 3345, with a tonnage of 3,352,995, and in the same period of 1899 the number of vessels entered was 3432, with a tonnage of 3,471,541. The most important articles imported into Belgium from the United States during these respective periods were Indian corn, wheat, spelt, meslin, petroleum (refined), oil cakes, tar, asphalt, etc., cotton and vegetable oils.

The Tariff.—Belgium was under a tariff revenue only from 1861 to 1884, when the government levied an import duty upon cattle and meats; in 1896 a duty upon oats, butter, etc., was also levied. The policy is practically that of free trade, but efforts have recently been made to introduce the protective system. At the close of 1898 and at the beginning of 1899 a bill, changing the tariff regulations, was under discussion. These changes affected the existing system of levying customs duties on goods taxable *ad valorem*. The new regulations required that the custom-house declaration for goods thus taxed must mention the value, place of origin, and place of manufacture, with the added cost of packing, transportation, etc., and that if the value declared is judged insufficient by the customs officer, he may demand from the importer a supplementary declaration and the immediate payment of the extra duty due. An arbitration commission, composed of five members, is appointed to decide in case of litigation the value of the goods imported, and in estimating their

value the commission may employ experts. If the commission verifies the correctness of the value declared by the importer, an indemnity of delay is awarded to the latter. The representatives of the foreign chambers of commerce requested certain amendments in the proposed law, objecting to the delay which would result in the delivery of the goods if the new law should be adopted and to the doing away with the system of preemption as practised at present. They agreed, however, to abandon the bonus of ten per cent. which the government pays in addition to the value of seized goods.

Efforts to Promote Trade.—Of late years there has been an attempt to develop a merchant marine. Belgian commerce is not important. For many years Belgian capital has been turned away from maritime enterprises into other channels, and instead of trading with distant countries, she has confined her trade mostly to her neighbors. Many favor the making of special efforts to encourage the building of sailing vessels, and urge the subsidizing of these vessels if it be found that they cannot compete with steamers. The progress recently made by Germany, and especially the great commercial advancement of England, have roused an interest on the part of Belgians in the development of their foreign trade. State aid is demanded until it be shown that the industry of ship-building can maintain itself. Another feature of the recent movement to develop Belgian commerce is the increasing interest in commercial education. At Antwerp there is a commercial institute, at which a diploma is given at the end of two years, except for those preparing for the Belgian consular service, who are required to pursue a course of three years. Practical as well as theoretical instruction is given, and the students are required to understand the transactions of commercial and counting-houses and matters relating to the theory of exchanges. A knowledge of French, German, and English is obligatory, and the student must also be able to correspond in one other language. The courses include political economy, international commercial law, and customs legislation. Travelling scholarships are imposed upon the most deserving students, a sum of nearly \$10,000 being devoted to this purpose each year. Many students have been sent abroad, especially to those countries in which Belgium is seeking to find a market. The expenses of attendance are comparatively slight, the tuition fee being about \$50 for the first year and \$60 for the second. In the interest of Belgian commerce plans for an important international exposition at Liege were discussed in 1899. The exposition will be held about May 1, 1903, and last six months, under the patronage of the Belgian government and the province and city of Liege. The exposition is said to be planned on a more extensive scale than that of Antwerp in 1894 or that of Brussels in 1897, and the buildings are expected to be begun early in 1900. Leading men of Liege were engaged in promoting the enterprise. Some comment was occasioned in 1899 by the restriction imposed by the Belgian government on the United States fruits and plants. The law of December 30, 1882, authorized the government to prescribe by royal order such measures as the fear of contagious diseases of domestic animals and plants may require in the regulation of commercial relations with foreign countries. Under this law a royal decree, dated February 3, 1899, prescribes that the importation and transit of fresh fruits, living plants, and fresh parts of plants, sent from the United States to Belgium, shall take place only by the ports of Antwerp, Ghent, and Ostend, and upon the production of a certificate from competent authority attesting that the products therein specified are not contaminated by the San José scale, this order to go into effect on March 15, 1899. In carrying out this decree, experts were appointed at Antwerp, Ghent, and Ostend to inspect these fruits and plants and supply certificates of examination.

From June 1 to September 1, 1899, an exposition of industries and arts was held in the city of Ghent. The display consisted almost entirely of machinery, including weaving, spinning, artificial ice, steam laundry, feed-cutters, boilers, engines, steam-pumps, coffee-grinders, and carpenters' and machinists' tools. The industries of the United States, England, Germany, and France were represented.

Political Parties.—The year 1899 marks a turning-point in the internal history of Belgium. The following account outlining the recent struggles of political parties and the outcome of these struggles is based mainly on the authority of M. Alexandre Halot, a contributor to the *Revue des Deux Mondes*. For fifty years political power has oscillated between the two parties named respectively Liberal and Catholic. At first these parties did not show the sharp antagonism toward each other that has marked their attitude in recent years. The Liberal party was by no means aggressive in its opposition to the religious programme of the Catholics. The general difference between them was that while the Liberal party held somewhat strictly to the doctrines of 1789, the Catholic party was more reactionary in spirit, although it adhered to the liberal constitution of 1831. But as time went on the issues became more distinctly defined. The Catholic party held to a purely ecclesiastical programme, and seemed to regard the defence of religious orthodoxy as its sole end.

The Liberals, on the other hand, especially that advanced wing called Radicals, gradually assumed an aggressive attitude toward religion, as if its main duty was to destroy the religious faith of as many citizens as possible. It was a contest between extremists, and left the region of practical politics for the debating ground of philosophy and religion. In these circumstances neither party represented the average opinion of the Belgian people, who, while attached to the Catholic faith, were by no means bigoted, and in general were opposed to the direct interference of the Church in political affairs. Complete political independence, combined with respect for the traditional faith of the people, was what the majority of the Belgians seemed to demand. The political parties, on the other hand, carried away by the extremist spirit of their leaders, became further and further separated from the general sympathies of the people at large. Whichever party came into power, it took no pains to satisfy the moderate class of deputies or of voters, but usually tried only to please its least moderate partisans. As a result of this, it often happened that the moderate voters, by whose support the party had gained power, turned against it at the moment of its triumph. The political history of Belgium is a record of these ups and downs. The triumph of one party was a signal for undoing everything that its predecessor had done, and for an exaggerated display of its religious or anti-religious tendencies. It was as if each party held itself to be the sole depository of absolute truth, in regard to which any form of compromise was sinful. Political dogmatism of the most irreconcilable kind was characteristic of party politics. On the one hand was M. Friere Orban, the Liberal doctrinaire, and on the other the ultra-Catholic, M. Woeste, and each seemed to regard his position as absolutely unchangeable. The moderate and reasonable statesmanship which would have given good government to the country at the same time that it fairly represented the majority of the people was wholly lacking. But in recent years a movement has been started for a new party which would represent the real interests of the people and be neither ultra-Liberal nor ultra-Catholic. This party is represented by such men as M. Beernaert and M. De Smet de Naeyer, who came in power in 1899. The former had held a ministerial position for ten consecutive years in the course of which he had worked at the difficult task of revising the constitution. This revision was necessitated by the growth of the democratic spirit. For a period of sixty years—that is, down to 1893—Belgium was under a constitution which gave no electoral influence to the proletariat.

The Electoral System.—The constitution of 1893 admitted to the suffrage every Belgian citizen 25 years of age, but sought to avoid the dangers of universal suffrage by the principle of supplementary votes for citizens having an especial interest in the maintenance of public order. The law is complicated. It gives a vote to every male citizen resident for five years in the same commune and not legally disqualified; two votes to citizens 35 years of age with legitimate issue and paying a land tax of at least 5 francs a year, the double vote being accorded on the principle that the interest of a father of a family in political affairs was greater than that of a single man; two votes also to citizens 25 years of age with immovable property valued at 2000 francs, and three votes to citizens 25 years of age who can give proof that they have received the higher education. The Liberals suffered severely by the operation of this law, and Socialists had for the most part taken their place in the chamber, such of the Liberals as were elected having owed their success to a coalition with Socialists. On the other hand, the Clerical right has increased out of all proportion to the actual number of sympathizers among the people. At the beginning of 1899 the deputies included 112 Clericals, 28 Socialists, and 12 Radicals, although there was no such preponderance in the electorate. Divisions among the opponents of the Clericals, and especially among the Liberals, were the chief cause of this large Clerical majority. The inactivity of the Liberals has permitted the Socialists to make rapid progress, and their constituency is estimated at some 300,000, including, however, not only those who are strict disciples of Karl Marx, but the members of the workingman's party. The Socialists have won votes by their energetic campaigning and by the measures which they have proposed for immediate reform. Many Liberals, disgusted with the inertia of their own party, have gone over to the Socialists. The latter have shown much skill and diligence in making converts. They have held many meetings and organized public processions; they have carried on an aggressive campaign in the press and have established many co-operative associations and leagues.

Proportional Representation.—The introduction of proportional representation was a part of the government's plan, but it was opposed by the Conservative element. After the advent of the Socialists as a third party in Belgian politics the operation of the electoral law reduced the representative system to a farce. Under the system of majority rule the chamber was composed of three factions, no one of which could resist its two rivals when combined. The Clerical majority was thus entrenched in power only by the folly of its opponents. A combination of some sort, either of

Liberals and Catholics or of Socialists and Liberals, was inevitable, since scruples on the score of principle are as a rule insufficient to prevent these alliances for the purpose of immediate gain. Toward the close of 1898 there was a strong movement in favor of a coalition between Liberals and Socialists. Prominent Liberals organized a society under the name of Liberal Alliance in order to conciliate the progressives and the doctrinaires by a free discussion of the theories that divided them. In several quarters there was a willingness to sink minor differences in an agreement upon a general programme which should have for its main object the overthrow of the Clericals. This was the situation at the beginning of the year 1899; both Socialists and Liberals were showing a spirit of compromise. Proportional representation would give to each party a representation in the chamber in proportion to the strength which it had in the population at large, and the chamber, instead of being merely the expression of the majority, would truly represent the whole population. Its friends said that it promised to introduce a period of prosperity and moderate progress, such as the majority of the people desired to see. All parties being represented in the chamber according to their numerical importance, there would be no chance for such complete domination by the majority as had characterized the existing system. It would, moreover, strengthen the hands of the more moderate members of the chief parties and prevent the repeated fluctuations from one extreme to the other. It was urged that the moderate Catholics and moderate Liberals would no longer be at the mercy of their Radical leaders and that they would find interests in common, and finally unite in a new party which would better represent the popular sentiment. For these reasons the reform was opposed by many of the leaders. Neither the chief of the left, M. Friere Orban, or of the right, M. Woeste, could approve it. The latter was especially hostile to this policy on account of his long-standing rivalry with M. Beernaert. He could not accept a reform which would allow the moderate members of the Liberal party to re-enter the chamber. In 1893 he had driven his rival from power, having marshalled the majority in the chamber against the plan for proportional representation. After the overthrow of M. Beernaert, M. Woeste was the preponderant influence in the government, though himself not holding office. For five years he dictated the policy of the Catholic ministries, which constantly went to extremes and greatly offended the moderates. The desperate condition of the Liberals, who had not a single deputy in the chamber, drove them to seek an alliance with the Socialists and the Radicals. The Socialists, in spite of the wide differences between them and the Liberals, showed themselves most eager for this alliance, since it would increase their electoral strength and injure the Catholic party.

The Government Measure.—In the presence of this danger of a solidified anti-Clerical opposition, the government, at the personal instance of the king, it is said, devised an electoral reform measure of its own. The result of this was a ministerial crisis. M. De Smet de Naeyer, president of the council, and M. Nyssens, minister of labor, resigned on the ground that they would not associate themselves with an electoral reform based on the principle which the government proposed, and M. Vandenpeereboom became prime minister. From January to July, 1899, M. Vandenpeereboom was president of the council. It was his plan first to find a majority in the chambers and then to redistrict the country in such a way as to insure Catholic success. Combination was formed in favor of a *scrutin de liste* in the least important districts and the proportional system in the most important districts. By adopting proportional representation in the larger arrondissements, where the anti-Catholics were in the majority, the Catholics were sure of gaining a certain representation from the important cities. Thus they renounced the chance of a total representation from the large cities for the certainty of a partial representation. Such a reform would bring them an immediate advantage, since in several of the large cities, particularly in Brussels, the issue was doubtful for the approaching elections for 1900 in view of the probable alliance of the two opposing parties. On the other hand the maintenance of the existing system of majority vote in the smaller places where the Catholics had a majority assured them that they would retain their seat. Thus the Catholics could support the measure with complacency. At the same time the Liberals were appeased by the chance of obtaining seats in the chamber where they had none at the present time. The measure was opposed, however, by the more advanced Liberals and the Socialists, and by most impartial judges. The latter saw in it a peril to the proposed alliance between them and the Liberals and they fought against it in order that a continuance of discontent among the Liberals might drive them into an alliance with themselves. The project might have been voted had it not been for a portion of the Catholic party itself, and especially of M. Woeste, who saw in it a partial triumph of the ideas which his rival, M. Beernaert, represented. He called the project indefensible and rallied in opposition all the enemies of the government.

Ministerial Crisis.—There were disorderly scenes in the chamber on June 27 and

28, and when the excitement spread to the streets there seemed at one time to be danger of revolution. The agitation forced the ministry to make some concessions. On July 4, M. Vandenpeereboom announced that the government would consent to a reference of the project to a commission representative of all parties. This commission rejected the government bill, together with the other projects that were referred to it. This called for the resignation of the cabinet, since it had been defeated at every point. M. De Smet de Naeyer, who had been a member of the cabinet, but had separated from it on the question of electoral reform, was entrusted with the mission of forming a new cabinet, and on August 5 it was completed. It comprised the following members: M. De Smet de Naeyer, president of the council and minister of public works; M. De Trooz, minister of the interior; M. Van den Heuvel, minister of justice; M. Van den Bruggen, minister of agriculture; M. Liebaert, minister of industry, labor, and railways; M. De Favereau, minister of foreign affairs; General Cousebant d'Alkemade, minister of war. On August 9 the premier, having announced that he would adopt proportional representation as a basis of electoral reform, presented to the chamber a bill framed on the same general plan as had been favored by M. Theodor, the leader of the new political party known as the Independents, which represented a spirit of compromise and moderate progress. The irreconcilable Catholics represented by M. Woeste did not relax in their hostility and accused the ministry of De Smet de Naeyer of destroying the Catholic party. The Catholic party was in fact hopelessly divided. One portion of it continued to follow its old leader, M. Woeste, the other supported the compromise cabinet. The Socialists, however, who logically should have accepted the new ministry, presented a formidable opposition. This was due to the effect of the new law upon the proposed alliance between the Socialists and the Liberals. Now that proportional representation was granted, the moderate Liberals would have no motive for such an alliance. The Socialists, therefore, did all they could to oppose the measure, urging as a pretext that they could not accept proportional representation unless universal suffrage was granted at the same time. They aimed at the dissolution of the chambers in order that in the new parliament the majority of two-thirds required by the constitution for the establishment of universal suffrage might be found. In this plan they were not supported by the moderate Liberals or by the chiefs of the Radical party, who were inclined to accept the measure offered by the government. The object of this bill was to apply the principle of proportional representation to the whole country and place all electors on a footing of equality. The measure was accepted by the chamber on November 24, 1899, by a vote of 70 to 63, and it seemed likely to succeed in the senate. It was opposed by the irreconcilable Clericals and by certain Liberals and Socialists who were not satisfied with proportional representation unless it were accompanied with universal suffrage. Thus at the close of the year 1899 it seemed likely that parliamentary government in Belgium would proceed in a more moderate and reasonable manner. One political party had for years been striving for this result. This was what may be called the progressive Conservatives or Independents, who were opposed to the extreme views of the Liberals and the Catholics. Its leader was M. Theodor, whose intervention between the two extreme factions in the chamber had led to the restoration of peace and the establishment of the De Smet de Naeyer ministry. The Independents were still comparatively weak in numbers, but their influence seems to be on the increase. Hitherto they have been too insignificant numerically to impose their ideas upon the majority. Now, reinforced by the moderate members of the Liberals and Catholics, they form a nucleus of a new governmental party, a party that favors gradual and moderate progress. At the same time the Christian Democrats, who represent the spirit of Leo XIII. in the matter of social reform, have cast in their lot with the Independents. M. Alexandre Halot, on whose authority the foregoing account is mainly based, sums up the matter as follows: "The maintenance of Belgian independence seems to be at the expense of the natural development of the old political parties. This development, however, conforms to the aspirations of the great majority of the people, and for the moment it deprives collectivists and republicans of their preponderating influence. The disappearance of a paternal royalty which, without speaking of the exceptional merits of its two illustrious representatives, has by its very existence kept the country for seventy years under continual tutelage, was in danger of transforming it into a second Transvaal. The struggle may be narrowed down in future at least in respect to its main outlines to the collectivists and the non-collectivists. It is among the latter that this great party has its origin, a party which faithfully represents the average opinion of the country, and not the extreme opinions of factions, and which admits the healthy parliamentary traditions of the united kingdom, at the same time so free, so religious, and so prudently and constantly progressive."

BELIZE. See BRITISH HONDURAS.

BELLEROSE, J. H., a senator in the Dominion Parliament, died at St. Vincent de Paul, Quebec, August 13, 1899. He was born at Three Rivers, Quebec, July 12, 1820. In 1873 he became a senator, representing the Conservative party.

BELOOCHISTAN or **BALUCHISTAN**. See **BALUCHISTAN**.

BERESFORD, REAR-ADMIRAL LORD CHARLES WILLIAM DE LA POER, the second son of the Rev. John Beresford, fourth Marquis of Waterford, born in Philiptown, County Dublin, Ireland, February 10, 1846, has had an honorable career both as naval officer and statesman. His name is now particularly associated with the partition of China. In 1898 he was sent to China by the Associated Chambers of Commerce of Great Britain on a special mission, and on his return to England in 1899, by way of the United States, he created great interest in the question of "an open door to China." He delivered many speeches in this country, declaring that England, the United States, Germany, Japan, and Italy have common interests in the division of China. (See **CHINA**.) His policy is, of course, anti-Russian. His book, *The Break-up of China*, was published in 1899. He entered the royal navy in 1859, and became sub-lieutenant in 1866, lieutenant in 1868, commander in 1875, captain in 1882, and rear-admiral in 1897. In 1875-76 he accompanied the Prince of Wales as naval aide-de-camp to India. In 1886 he was made a lord-commissioner of the admiralty, but resigned in 1888 on the question of strength of fleet. He has received three medals for having saved lives at sea on three different occasions, and various other medals for bravery, notably for the "Condor" bombardment, Alexandria, 1882. In 1884 he was appointed on the staff of Lord Wolseley for the Nile expedition, and was in command of the naval brigade with Sir Herbert Stewart across the desert. In 1885 he rescued Sir Charles Wilson's party, wrecked on their return from Khartoum. While commanding the cruiser *Undaunted* in the Mediterranean, he saved the French cruiser *Seignelay* from shipwreck, and received the thanks of the French government. In 1893-96 he was in command of the steam-reserve at Chatham. Lord Charles Beresford sat in the House of Commons for the county of Waterford (Conservative) from 1874 till 1880, and effected several naval reforms. He represented Marylebone from 1885 till 1889. In 1897 he was appointed naval aide-de-camp to Queen Victoria, and took part in the Jubilee procession. In 1898 he was elected for York. He left England for the East August 24, 1898, and returned in the latter part of 1899. His principle is that "no commercial development of China is possible until China can guarantee security to trade and commerce by adequate and efficient military and police protection." Lord Charles Beresford is the author of *Nelson and His Times*, and many essays on Egypt, China, and naval subjects. In the latter part of 1899 he was appointed to be second in command of the Mediterranean fleet.

BERMUDA, or Sommer's Islands, a group of some 360 small isles and islets lying in the Atlantic Ocean in 32° 15' north latitude and 64° 51' west longitude, is a colony of Great Britain, having an area of about 20 square miles, and a population in 1897 of 16,098, of which 6184 were whites. Only some 20 of the islands are inhabited, most of the rest being little more than projecting rocks. The chief town and seat of government is Hamilton (pop., 1296), on Long Island. The nearest mainland is the North Carolina coast, Cape Hatteras being some 580 miles distant. The distance from New York is 677 miles. The government of the colony is administered by a governor, who is also commander-in-chief of the British military forces stationed there. He is advised by an executive council of 6 members, appointed by the crown. In addition there is a legislative council of 9 members, also appointed by the crown, and a house of assembly of 36 members, 4 members being elected from each of the nine parishes. The governor since 1896 has been Lieutenant-General George Digby Barker, C.B. Bermuda is an important naval base; the average number of British troops there is reported at 3178. Of the 57 schools, 24 receive government aid amounting each year to £1224. The number of pupils is upward of 1400. The chief source of revenue is customs duties, and the leading items of expenditure are salaries and appropriations for public works, churches, and schools. The revenue and expenditure for 1897 were £35,965 and £35,704, respectively; for 1898, revenue £38,923, expenditure £39,102. At the end of the latter year the public debt was £45,600. The principal crops are onions and potatoes; other products are lily bulbs, melons, pumpkins, and arrowroot. The trade, which is chiefly with the United States and Canada, amounted in 1897 to £127,703 for exports, and £323,148 for imports. On July 24, 1899, an agreement was made with the United States, effecting the reduction of import duties on certain American products, and a 20-per-cent. reduction of the duty on Bermudian vegetables at American ports. There are 51 miles of telegraph wire, 15 of which are submarine. Since 1890 there has been telegraphic communication with Halifax, N. S. The salubrity of the climate and the agreeable temperature have made the islands a favorite winter resort for Ameri-

cans and Canadians. On September 12, 1899, a hurricane did great damage to property in the islands. See ZOOLOGICAL STATIONS.

BERRY, Rev. CHARLES ALBERT, D.D., English Congregational clergyman, died at Bilston, Staffordshire, January 31, 1899. He was born at Leigh, Lancashire, December 14, 1852; was educated in a private school at Southport and at Airedale Independent College, Yorkshire. He held a pastorate at Bolton from 1875 to 1883, and at Wolverhampton from the latter year to the time of his death. He received many calls to other charges, including one to succeed Henry Ward Beecher in Plymouth Church, Brooklyn, but he declined them all. Dr. Berry travelled widely; he visited the United States in 1880, 1887, 1891, and 1897; made a tour through Egypt, Palestine, and other parts of the Levant in 1886; and in 1891-92 travelled around the world, visiting Australia and New Zealand. In 1895 he received the degree of Doctor of Divinity from St. Andrews University. He was ex-president of the National Council of Evangelical Free Churches, and in 1897 was chairman of the Congregational Union of England and Wales. In this year he represented the Arbitration Society in America, and advocated the reconsideration by Congress of the Anglo-American treaty. To this end he made addresses in many of the principal American cities. Besides various papers and a volume of sermons he published *Vision and Duty*, 1892, and *Mischievous Goodness*, 1897.

BEVERIDGE, ALBERT J., United States senator from Indiana, was elected as a Republican to succeed Senator David Turpie, Democrat, January 17, 1899. At the time of his election Mr. Beveridge was 36 years old, and is thus the youngest man in the Senate except Senator Butler, of North Carolina, who is his junior by a few months. Mr. Beveridge, who, before this election, had never been chosen to public office, has won prominence at the Indianapolis bar, and is known not only as an able lawyer, but as an orator of considerable power. He began life on an Ohio farm, and worked his way through De Pauw University, graduating in 1885, in which year also he took first honors in the State and interstate collegiate oratorical contests. His health gave way after graduation, and for a time he followed an out-of-door life on a ranch in the far West. After his election to the Senate in 1899, Mr. Beveridge went to the Philippine Islands for the purpose of making a personal investigation of the question most prominent in American politics during the year. The result of these observations was his agreement with the report of President Schurman, Admiral Dewey, and the other members of the Philippine Commission, endorsing the administration's policy of putting down the insurrection and retaining the islands. Mr. Beveridge's term of office will expire March 3, 1905.

BIBLE SOCIETY, AMERICAN, founded in 1816 for the gratuitous distribution of Bibles among the destitute, reports for 1899 receipts amounting to \$352,217. It issued 1,380,822 copies of various publications, more than half of which were distributed in foreign lands. The society publishes the *Bible Society Record*. President, Enoch L. Fancher, LL.D. (deceased); secretary, Rev. William I. Haven, D.D., Bible House, New York City.

BICYCLING. See CYCLING.

BILLIARDS. The Amateur Athletic Union's efforts to control amateur billiards were prosecuted vigorously during 1899, but two factions rebelled against the union's restrictions, and formed separate organizations, in New York and Chicago. On October 27 the National Association of Amateur Billiard Players was organized at New York, with Orville Oddie, Jr., as president, and Charles W. Minor as secretary. The A. A. U., however, held its usual championship meetings to correspond with those for the preceding season, and debarred those who played in unregistered tournaments. Three new billiard records were made at the 1899 championships—namely, for the highest amateur (class A) run, the highest amateur (class A) average, and highest amateur (class B) average. These will be noted in the account of plays which follows. The A. A. U. championships were held at New York. The class B tournament, December 4-19, 1898, was won by J. Byron Stark, New York, 6 won games out of 6 played; highest run, 47; best average, 10.34; grand average, 7.72, his best average being a new (class B) record. The class A tournament, February 14-19, 1899, was won by Martin Mullen, Cleveland, 3 won games out of 4 played; best run, 73; grand average, 8.29; second place, W. P. Foss, Haverstraw, N. Y., 2 won games out of 4; best run, 133; grand average, 8.26; third, W. C. McCreery, New York, best run, 139 (new record); grand average, 9.16; besides making the highest amateur run on record, McCreery also made a new amateur record, 13.33, for a single-average. The class A games were 400 points each, 14-inch balk-line, 10 shots allowed in the anchor spaces; the class B games were 300 points, 14-inch balk-line, with the "anchor-nurse" allowed. Two important professional matches in billiards were played in 1899, between George F. Slosson and Jacob Schaefer, at New York City, in the fall and spring, respectively. The first was a two-game match, May 15 and 22; first game (18-inch balk-line) won by Schaefer—

total, 600; average, 13 28-44; high run, 139; Slosson—total, 418; average, 9 31-43; high run, 62; second game (cushion carroms) won by Slosson—total, 400; average, 4 52-87; high run, 34; Schaefer—total, 359; average, 4 15-86; high run, 55. The second match was at cushion carroms, and was held on October 30 and two succeeding nights; the final results were as follows, Slosson being the winner: Grand totals—Slosson, 900; Schaefer, 757; grand averages—Slosson, 4.56; Schaefer, 3.84; biggest runs—Slosson, 37; Schaefer, 41. Frank C. Ives, generally considered as the best billiard player in the world, died at El Progreso, Mexico, on August 30. On April 2, 1898, at Chicago, he defeated Schaefer in a balk-line game for the world's championship by 600 to 427. At the time of his death he held these records for 1899: Highest run for tournament play, 85 points, made at Boston, 1896; highest run (with "anchor-nurse" barred), 359 points, Chicago, 1894; highest average, with "anchor-nurse" allowed (held also by Schaefer), 100, Chicago, 1894; same, with "anchor-nurse" barred, 63 2-10, New York, 1894; the above are all in cushion carrom games. Eighteen-inch balk-line, highest run for tournament play, 290 points (5 shots allowed in the anchor spaces), New York, 1896; with "anchor-nurse" barred, 140 points, New York, 1897; highest average for tournament play, 50 (5 shots allowed in the anchor spaces), New York, 1896.

BILLOT, JEAN BAPTISTE, French general and senator, who was conspicuous in the Dreyfus case, was born at Chaumel, August 15, 1828, admitted to the École de St. Cyr in 1847, and appointed to the staff in 1849. In 1870 he became colonel, and after the Franco-German War, in which he made his mark, he was elected to the national assembly. He sat among the Republicans of the Left, and opposed the attempts to restore the monarchy in 1873. In 1875 he was elected senator, and in 1878 was instrumental in passing a bill for reorganizing the staff of the French army. In 1882 he became minister of war in the Freycinet Cabinet, but resigned in 1883 because he would not deprive the Orleans princes of their military rank. In 1859 he was made Chevalier of the Legion of Honor, and in 1889 was given the Grand Cross. In 1897 he was concerned in the Dreyfus case, and was afterward prominent for his efforts to divert suspicion from the French army. He retired in June, 1898, but he appeared as a witness in the Dreyfus trial of 1899. See FRANCE (paragraphs on History).

BIOLOGICAL STATIONS. See ZOOLOGICAL STATIONS.

BIOLOGY. During the year 1889 the investigations of biological questions have gone on along quite different lines from those of the preceding year. There has been no important contribution to the discussion of vitalism, which was such a notable topic in 1898, and the question of heredity has received its most valuable treatment this year from the practical zoologists and botanists, rather than from those who deal more especially with the theoretical side of the problem. Dr. Pearson has, however, continued his important papers under the title of *Mathematical Contributions to the Theory of Evolution*, three parts having been published, as follows: I. *Theoretical*. II. *On the Inheritance of Fertility in Man*. III. *On the Inheritance of Fecundity in Thoroughbred Race Horses*. The evidence presented in these papers seems to show that fertility is inherited in man and fecundity in the horse, and "therefore probably that both these characters are inherited in all types of life."

An interesting paper, illustrating the biological phenomenon known as *convergence*, has been published by Dr. C. H. Eigenmann in continuation of his work on the blind fishes of caves. He has shown by comparative study of the blind fishes of the caves of Missouri and Kentucky that they represent quite different species, which have become superficially very similar because of similarity in their habits and environment. A still more important paper, throwing light on quite a different phenomenon, is that by Dr. Alexander Graham Bell, *On the Development by Selection of Supernumerary Mammary in Sheep*, presented to the National Academy of Sciences in April. In this paper, Professor Bell gives an account of experiments made on his Nova Scotian farm to "ascertain whether by selective breeding supernumerary mammary could be developed from a rudimentary condition into real functional nipples yielding milk, and whether in this case the fertility of the ewes would be increased." The result of these experiments shows conclusively that the supernumerary mammary could be developed by selective breeding into functional nipples. More than this, Dr. Bell shows that he has actually established a breed of sheep in which females with two nipples are entirely wanting, those with three are rare, the great majority have four or five, while twenty per cent. have six. Whether this has resulted in increased fertility in the ewes is not stated.

The other important work of the year bearing on the subject of general biology may be grouped under two heads, Regeneration and Hybridization.

Regeneration.—Under this head two papers of more than usual importance have been published. One of these appeared in the *Bulletin of the Johns Hopkins Hospital*, and gives an account of some experiments made by Dr. R. G. Harrison with

tadpoles to determine the nature and extent of their powers of regeneration. The experiments were made with the tadpoles of two species of frogs, and owing to their different color markings it was possible to trace very exactly the results of each experiment. The possibility of grafting the tail of one individual on to the head of another, even where the two are of different species, was shown, and the results of these and other sorts of graftings were carefully noted. The other paper on regeneration deals with the question from the theoretical point of view, and is from the pen of the well-known German zoologist, Weismann. It was first published in the *Anatomischer Anzeiger* and *Natural Science*, and was later issued in pamphlet form. He first expounds the proposition that "the regenerative power of a part is to be considered not as a direct and necessary expression of the nature of the organism, but rather as a capability, which, though it may be absent, is found wherever it is necessary in the interests of species preservation." He then examines the objections to this view and shows why he regards the facts which are as yet known as really supporting rather than serving to overthrow his view. The second part of the essay is an attempt to show that regeneration phenomena are interpretable on "the ontogenetic theory of determinants, reserve germ-plasm, etc." This second part is entirely independent of the first and is of much less general interest, though of great importance to those interested in theories of heredity.

Hybridization.—Under this topic we have to deal with two very different subjects, but each of which is important. The first is the "International Conference on Hybridization," which was held at Chiswick, in England, under the auspices of the Royal Horticultural Society. The second is the account which Professor J. C. Ewart has published of his experiments in search of evidence in support of the famous theory of *telegony*. The former dealt with the subject of hybrids almost wholly from the botanical point of view, but the results of such a conference are of great interest to every biologist. Only two days were given to the conference, July 11 and 12, but a dozen papers were read and others will appear in the published report. Besides England, five countries were represented—France, Germany, Holland, Switzerland, and the United States. The topics which were discussed included such fundamental ones as the conception of species, the limits of hybridization, prepotency, the character of hybrids, etc. A number of important topics, however, were scarcely touched on, because of the limited time, and it was suggested and hoped that another conference might be held in the near future.

Professor Ewart's accounts of the experiments which he has been making in the crossing of the zebra and the horse are beyond question the most important papers bearing on biological problems which have appeared during 1899. These are already well known as the "Penycuik Experiments," and are the most thorough and satisfactory which have ever been made in testing the results of cross-breeding among mammals. The experiments are still in progress, but are now so far along that Professor Ewart felt justified in publishing some of his results. They first appeared in book form under the title *The Penycuik Experiments*, and a little later a paper was presented to the Royal Society on *Experimental Contributions to the Theory of Heredity. A. Telegony*. It is impossible in the brief space at our disposal here to give anything like an adequate account of these experiments or their results. They were undertaken to determine whether a sire can in any way affect the offspring of subsequent sires in any given female—that is, if a mare is covered by a zebra stallion and bears a hybrid foal, and then is covered by a stallion of her own breed, will her foal show any signs of the previous intercourse with the zebra. Professor Ewart crossed an Island of Rum mare with a zebra stallion, and, as might be expected, the foal was decidedly zebra-like. She was then crossed with a gray Arab stallion and in subsequent years with stallions of other breeds. As a result of these and a number of similar experiments, Professor Ewart finds no evidence in support of the theory of *telegony*—that is, the influence of the zebra sire affects only his own descendants. He does find, however, that the crossing of distinct species leads to reversion, thus giving support to one of Darwin's theories. He concludes from studying his hybrids that the Somali zebra is in its color pattern the most ancestral form of the modern equidæ. One other important result of these experiments was to show that these zebra mules are not immune to the poison of the tsetse fly. It was hoped that they might prove to be, but the three which were inoculated with the poison, though more resistant than horses, died in about eight weeks. See ZOOLOGICAL LITERATURE (paragraph General Treatises).

BIRD PROTECTION. See ORNITHOLOGY (paragraph Organizations).

BISMARCK ARCHIPELAGO comprises several groups of islands in the Pacific Ocean, to the north of the eastern portion of New Guinea. They include the New Britain Archipelago and several adjacent groups, and have formed a German protectorate since 1884. The chief islands are Neu Pommern, Neu Mecklenburg, Neu Lauenburg, Neu Hannover, Admiralty, Anchorite, Commerson, Hermit, and others,

with an area of about 20,000 square miles and a population estimated at 188,000. The chief exports are cocoanut fibre and copra. Cotton raising is an important industry. The German New Guinea Company, which controls most of the commerce, has a trading station at Matupi.

BLAIKIE, WILLIAM GARDEN, D.D., LL.D., educator and author, was born at Aberdeen, Scotland, February 5, 1820; died at North Berwick, June 11, 1899. He was the son of James Blaikie, Lord Provost of Aberdeen, and was educated at that university and at the University of Edinburgh. He was ordained minister of Drumblade in 1842, and the next year he joined the Free Church of Scotland. From 1868 to 1897 he was professor of theology, Free Church, Edinburgh. Dr. Blaikie was one of the principal promoters of the Pan-Presbyterian Alliance, of which he was president from 1888 to 1892, presiding in the latter year at the meetings in Toronto, Ontario. In this year also he was chosen moderator of the general assembly of the Free Church. He was editor of the *Free Church Magazine*, 1849-53; of the *North British Review*, 1860-63; of the *Sunday Magazine*, 1870-74, and of the *Catholic Presbyterian*, 1879-83. Among his many works are: *Bible History*, 1859; *Bible Geography*, 1861; *Better Days for Working People*, 1863; *Heads and Hands in the World of Labor*, 1865; *For the Work of the Ministry*, 1875; *Inner Life of Our Lord*, 1876; *Personal Life of David Livingstone*, 1880; *Public Ministry of Our Lord*, 1883; *Leaders in Modern Philanthropy*, 1883; *Preachers of Scotland*, 1888; *Expositor's Bible*, 1888-93; *Summer Suns*, 1890; *After Fifty Years*, 1893; *Heroes of Israel*, 1894; *Life of Chalmers*, 1897; *Memoir of Principal David Brown*, 1898.

BLAIR, General CHARLES W., died at Kansas City, Mo., August 21, 1899, at the age of seventy years. He was born in Georgetown, O.; he entered politics and rose to a prominent place in the Democratic party of that State. At one time he was candidate for the lieutenant-governorship, and failed of election by only a small number of votes. He helped organize the Second Kansas regiment in the Civil War, organized the Blair Battery, and became colonel of the Seventh Cavalry. President Lincoln recommended his promotion to the rank of brevet brigadier-general, and he received his commission from President Johnson. At the time of his death he was attorney for the Kansas City, Fort Scott and Memphis Railroad.

BLAIR, JOHN INSLEY, the prominent financier, died at Blairstown, N. J., December 2, 1899, at the age of ninety-seven years. He was possessor of a vast fortune and well known for his philanthropy. His active business connections were broken off only four years before his death. He made his start as a shopkeeper, but in 1839 "Blair, of Blairstown," as he became known among financiers, associated himself with the Scrantons, who also gave their name to a town, in developing the iron business, and these men, with others, bought and constructed a little road from Owego to Ithaca. In this way he began his career as a builder of railroads. In the following years he built with his own and his associates' capital, in part, nearly thirty railroads, greatly developing the West. The more important lines in which he was most actively interested were the Delaware, Lackawanna and Western, Chicago and Northwestern, Chicago and Pacific, New York, Susquehanna and Western, and the Union Pacific railroads. Before the consolidation era it is said that he owned more miles of railroad than any other individual, being president or large stockholder in twenty roads. But his enterprises were not confined to railroads. From the enormous land-grants received in the West he laid out sites for what are now more than one hundred flourishing cities and towns. His iron interests, also, begun with the Scrantons, expanded into several large manufactures, and he had extensive mining interests. As a philanthropist, one of his last gifts was Blair Hall, at Princeton. Besides large gifts of money to that university, he endowed a professorship there. He gave Lafayette College nearly \$90,000 and rebuilt Grinnell College, Iowa. The Presbyterian Academy at Blairstown was founded by him and endowed to the amount of \$600,000. His religious and charitable donations were large. Besides building the Methodist church at Blairstown, he caused the erection, it is said, of over one hundred churches throughout the country west of the Great Lakes.

BLANCO, ANTONIO GUZMAN. See GUZMAN-BLANCO, ANTONIO.

BLAND, RICHARD PARKS, Democratic member of Congress from Missouri, whose death occurred at his home, near Lebanon, in that State, June 15, 1899, was for many years one of the foremost advocates of the free coinage of silver by the United States government. He was born near Hartford, Ky., August 19, 1835. In his youth he worked on a farm in the summer months to provide means for attendance at school in the winter. At the age of eighteen he attended the Hartford Academy for a year, and then after teaching school for a few terms started for California in 1855. On the way he stopped in Wayne County, Mo., and taught school for a term. During the next ten years he turned to various occupations in California, Nevada, and Colorado. He studied and practised law, being admitted to the bar in 1860. At one

time he was treasurer of Carson County, Col., which at that time was a part of Utah. Returning to Missouri in 1865, he practised law in Rolla, and four years later removed to Lebanon. In 1872 Bland was elected to the Forty-third Congress, as a Democrat, from what was then the fifth district of Missouri. In this Congress he opposed the act demonetizing silver, which he and others subsequently termed "the crime of '73;" he also opposed the system of national banks, and supported the bill, vetoed by President Grant, for the increase of the greenback circulation from \$375,000,000 to \$400,000,000. Elected to the next Congress, he was appointed chairman of the committee on mines and mining, and from that committee reported the first bill introduced in Congress for the free coinage of silver since its demonetization. The House had a Democratic majority for the first time since Buchanan's administration, and in its second session passed the bill. The measure, however, failed of consideration in the Senate. This Congress authorized the Silver Commission, of which Bland was a member, and after an exhaustive examination of the subject he submitted to the next Congress (the Forty-fifth), to which he had been returned, his elaborate "Silver Commission Report." Bland then introduced his famous bill for the free and unlimited coinage of silver, which was passed in the House by more than a two-thirds vote. The Senate adopted the amendment made by Mr. Allison, striking out the feature of unlimited coinage and substituting a provision for the purchase and coinage each month of not less than \$2,000,000 or more than \$4,000,000 worth of silver bullion. The supporters of the bill in the House concluded that they could not do better than accept the amendment, but the bill, even though amended, was vetoed by President Hayes, and then was passed over the veto on February 28, 1878. This "Bland-Allison law" was repealed by the passage of the Sherman bill in 1890, but it was not before 380,000,000 standard dollars had been coined under its operation.

As a member of the Forty-sixth, Forty-seventh, and Forty-eighth Congresses, Bland was prominent as an advocate of tariff reform and as an opponent of the rechartering of national banks. In the last-named Congress and in the Forty-ninth he served as chairman of the committee on coinage, weights, and measures. He again reported a bill for the free coinage of silver, and though this failed of passage, Bland succeeded in defeating the proposed suspension of the law of 1878. In the Fiftieth and Fifty-first Congresses he was active in opposing the Republican policy of the protective tariff, first in 1888 by his support of the Mills bill, which failed in the Senate, and secondly by his opposition to the McKinley bill of 1890. In the latter year the Bland-Allison law was repealed by the passage of the Sherman act. This act Bland made strenuous but unsuccessful efforts to amend with a free-silver clause. The year 1894 was notable for general Republican success, and Bland was not returned to the Fifty-fourth Congress; he was re-elected, however, to the Fifty-fifth, and in November, 1898, to the Fifty-sixth. At the Democratic national convention at Chicago in 1896 Bland received on the third ballot 291 votes for the presidential nomination, but after the fourth ballot his name was withdrawn. He was a member of Congress from 1873 to 1895 and from 1897 to the time of his death. In the House of Representatives he was a man of large influence. It has been said, indeed, that "probably no Democrat in Congress had a more influential share in fastening on the party the political tendencies and policies which now [the time of his death] form its accepted creed."

BLOMPFIELD, Sir ARTHUR WILLIAM, M.A., A.R.A., died October 30, 1899. Sir Arthur was a well-known architect. He was born March 6, 1829, and was a son of the late Rt. Rev. Bishop of London. He was prepared for the university at Rugby and was graduated from Trinity College, Cambridge. At Cambridge he was a member of the crews. Sir Arthur was appointed architect to the Bank of England, 1883. His title was created in 1889.

BOAT-RACING. See ROWING.

BOOKUM-DOLFFS, FLORENS HEINRICH VON, German statesman, died at Soest, Westphalia, February 8, 1899. He was born at Soest, February 19, 1802; studied law and political science in Heidelberg and Berlin, and became in 1837 magistrate of his native district. In 1847 he became a member of the *Landtag*, and from 1849 to 1851 was in the first chamber; at this time he was a zealous representative of liberal political views. He was elected in 1852 to the assembly (*Abgeordnetenhaus*), in which he remained continuously until 1885. Here, despite a lack of oratorical skill, he came to have much influence, and in 1861 was one of the leaders of a new party, which later was known as the Left Centre, and had a place between the extreme and the moderate Liberals. In 1863 he was made president of the house. From 1867 to 1870 he was a Liberal member of the North German and from 1871 to 1884 of the German *Reichstag*.

BOERS. See TRANSVAAL.

BOHEMIA, a province of Austria-Hungary, with an area of 20,060 square miles and a population of 5,843,094 on December 31, 1890, and of 5,942,728 on December 31, 1893. About two-thirds of the population are Czechs and one-third Germans. In the central government Bohemia is represented by 110 members in the *Reichsrath*. The local government consists of a provincial diet of one assembly, with a membership of 242. It is summoned annually and its deputies are elected for six years. For higher education it has a German university and a Czech university at Prague, German and Czech technical high schools and an art academy at Prague, a school of mines at Příbram, and four theological seminaries. In 1897-98 the German university at Prague had 1321 students and the Czech 2831 students. In the same year the gymnasia and real-gymnasia numbered 56; the *real* schools, 25, and the intermediate schools, 81. There are also normal schools and commercial and industrial schools. The country is rich in natural resources. The forests, though they have supplied fuel for many centuries, are still extensive, owing to the wise care of the government in providing for the planting of trees in place for all that are cut down. The agricultural land covers an area of 2,625,376 hectares, of which 1,618,995 were planted with grain in 1897. Among the chief crops are wheat, rye, oats, barley, potatoes, beet-root, flax, and hay. Game is abundant, and includes deer, hares, rabbits, partridges, grouse, and pheasants. Coal is the chief mineral product, but graphite, gold, silver, lead, tin, antimony, and iron are also found. Among the chief industries are brewing and sugar refining. Match factories, tobacco works, distilleries, and furniture factories are also numerous. Bohemia carries on a considerable trade with the United States. The figures for the whole country during 1899 were not available, but from the United States Consular Reports of August, 1899, it appears that the recent decline in Bohemian trade has come to an end, and that trade conditions as a whole show an improvement, although there was a falling off in the exports for the first quarter of 1899 as compared with the first quarter of the previous year. A large number of electric-car lines have been projected, and there is an active demand for electrical supplies. Wages are low, especially in the linen industry and in branches of the glass industry. Labor organization has recently made considerable progress in Bohemia and has supported strikes for higher wages. In 1899 a strike occurred at Nechod among the linen weavers, and gave rise to a riot, in the course of which several shops were plundered. It was suppressed by calling on the militia. Bohemia is the most productive state in Austria, but the existence of the bitter strife between the Czechs and the Germans has interfered with trade in the last few years.

Political Situation.—For many years Bohemia has been striving for the same measure of local independence which was granted to Hungary in 1867. Latterly the antagonism between the German and Czech races has grown more acute, especially since the formation of the Young Czech party, with its intense national spirit. The bitter quarrel over the language question, which marked the years 1896 and 1897, continued during 1899. The demand of the Czechs that the Bohemian tongue should be placed on the same footing as the German was at last met by the Badeni ordinances, passed in April, 1897; but the opposition of the Germans led to the overthrow of the Badeni cabinet, and on February 24, 1898, the new cabinet substituted for the Badeni ordinances an arrangement which was more favorable to the German language, although it was by no means satisfactory to the German element in the population. The Bohemians desired a system of federalism—that is, an increase of the legislative powers of each of the seventeen provinces. The policy of the nationalists seemed to be to exclude the Germans as far as possible from the administration. A method of compromise which appealed to some statesmen was to grant each nationality its own national territory, but this met with much resistance. In parts of the empire it was impossible to make administrative divisions conform to the nationalities. Where one nationality was in the majority it was difficult to check its tendency toward expansion. As to the language, the matter is complicated by the fact that even between Slavic races which speak different dialects the German language is used as an intermediary. The central authorities also use the same tongue in their communications with one another. It is impossible for parliament to carry on a discussion in eight languages and even more absurd that an army composed of soldiers speaking different languages should not have a single tongue adopted for commands. The federalists would have an army of national defence for each province, and the commands should be given in the national tongue. The imperial army would not be a unit, and there would not be unity in the civil administration. This was the objection made to the federalist programme. The Germans charged the Slavs with desiring the destruction of the empire. They did not wish to see the German minority absorbed by the Slav majorities. They favored a policy which would suppress so far as possible the spirit of nationality and would redistrict the empire in violation of national lines. This met with bitter opposition from the Slavs. On their side they feared opposition from the German

minority, and were opposed to a limitation of their national expansion. This was especially true of Bohemia and of Moravia and Silesia, which once belonged to the kingdom of Bohemia. The Germans claimed that justice and the practical needs of the country and local conditions required a division of the Bohemian territory into national districts. They held that where the German language was spoken by the majority it should become the official language.

On the other hand, the Bohemians were working for a settlement of the matter on a basis that seemed to threaten the unity of the empire. They opposed the making of German the intermediate language for the different races of Austria and the requirement that all state officials should give proof that they knew German. They regarded such measures as a menace to the national spirit of Bohemia. The German party were willing to allow each province where more than one language was spoken to settle the language question according to the wishes of the majority. Their chief purpose seemed to be to take the regulation of the language matter out of the hands of the executive and give it over to the *Reichsrath*, which should promulgate a new law, while the federalists wished the question to be left to the diets of the different provinces. See AUSTRIA-HUNGARY.

BOKHARA, a state of central Asia, which since 1868 has been a vassal of Russia. It lies to the south of Russian Turkistan and to the north of Afghanistan. It is under an Ameer (Sayid Abdul Ahad in 1899). It has an area of about 92,000 square miles and a population of about 2,500,000. Bokhara is the capital, with about 100,000 inhabitants. The dominant race is the Uzbek, but the aboriginal inhabitants are Tajiks. The people are Mohammedans of the Sunni sect. The chief products are corn, fruits, cotton, silk, wine, tobacco, and hemp. The live stock includes sheep, horses, goats, and camels. Among the mineral products are gold, salt, alum, sulphur, and coal. There is an extensive trade, which is valued at 32,000,000 roubles annually. The latest figures show that the trade is chiefly with Russia, Persia, Afghanistan, and India, but Russia and Persia take up by far the largest part. Among the chief exports are raw silk and cotton, and among the imports are green tea, indigo, muslins, drugs, shawls, etc. Russian steamers ply along the Oxus or Amu-Darya, which forms its southern boundary, and the Russian Trans-Caucasian Railway traverses the country, passing within a few miles of the capital. A telegraph line connects Bokhara and Samarkand. The Russian government permits the Ameer to maintain a native army for administrative purposes, numbering about 20,000. Military instruction is given by Russian officers. There is a Russian political resident at the court.

BOLIVIA, one of the two interior republics of South America, is bounded on the north and east by Brazil, on the south by Paraguay and Argentina, and on the west by Chile and Peru. The capital is Sucre.

Area and Population.—The country consists of nine departments, the total area of which is 597,340 square miles. This includes the Littoral department of 29,910 square miles, containing the ports of Antofagasta and Arica, which was mortgaged to Chile after the war of 1879-80, and has never been redeemed. The total area of the existing departments, then, is placed at 567,430 square miles. The last official estimate placed the population, exclusive of the inhabitants of the Littoral department, at 2,019,549; there are said to be about 1,000,000 Indians, 500,000 whites, and 500,000 Mestizos. The department of largest area and largest population is La Paz de Ayacucho (area, 171,130; population, 593,779). Beni is the least populous department (area, 100,580; population, 26,750), and Cochabamba the most populous (area, 21,430; population, 360,220). Oruro is the smallest (area, 21,350). The estimated populations of the principal towns are: La Paz, 40,000; Cochabamba, 25,000; Sucre, 20,000; Potosi, 20,000; Oruro, 15,000; Santa Cruz, 10,000; Tarija, 10,000.

Government.—By the constitution, which dates from October, 1880, the chief executive authority is vested in a president, who is elected by popular vote for a term of four years, and is assisted by a cabinet, comprising the portfolios of foreign affairs and worship, government and colonization, finance and industry, justice and public instruction, and war. The president is not eligible to election for the ensuing term. For the term beginning August 15, 1896, the president was Señor Servero Fernandez Alonso, but as a result of the revolution, described below, General José Manuel Pando was elected president on October 26, 1899. Señor Lucio P. Valesco became first vice-president.

The legislative power devolves upon a congress of two houses, the senate and the chamber of deputies; the members of the former are 18 in number, and are elected for six years; and of the latter, 64 in number, and elected for four years. Legal voters must be able to read and write. The departments, which are administered by prefects, comprise 52 provinces and 374 cantons, administered, respectively, by sub-prefects and magistrates (*corregidores*). The capital of each province has

a municipal council. Besides local justices (*alcaldes*) throughout the country, there are eight district courts and the supreme court.

Army.—Besides the standing army of 2000 men, there is a national guard of about 80,000. Militia service is incumbent upon citizens between 21 and 50 years of age. The cost of the army for 1897 was estimated at 1,748,697 bolivianos. There is a military school, having 9 professors and about 60 cadets.

Finance.—The principal sources of revenue are customs, silver and other minerals, liquor taxes, and stamps; the chief items of expenditure are instruction and public works, war, and finance. The revenue and expenditure in bolivianos for 1896 have been reported at 3,566,777 and 4,264,681, respectively; the revenue for 1897 was 4,840,300 bolivianos; for 1898 the estimated revenue was 5,194,593 and the estimated expenditure 5,714,793. The annual provincial revenue, used for provincial administration and local improvements, is about 600,000 bolivianos. At the close of the fiscal year 1897 the external debt, due to Chilean creditors, was 1,084,555 bolivianos; to the payment of this 40 per cent. of the customs collected at Arica, the privileges of which port are still allowed Bolivia, are applied. In 1898 the internal debt was 3,707,541 bolivianos. There are two banks of issue in the country and three mortgage banks. The value of the boliviano in United States currency on October 1, 1899, was \$0.436.

Industries and Commerce.—Though large areas of Bolivia are suitable for cultivation, agriculture is in an unprogressive state; manufactures of any considerable importance are almost unknown. Accurate data of the production and commerce of the country as a whole cannot be obtained, since there is no official statistical bureau. The important products include rubber, cocoa, cinchona, and coffee. The production of cereals, beans, and potatoes is sufficient only for domestic consumption, although the country is well adapted for their cultivation. Sugar-cane grows readily, but it is cultivated only to a small extent, and the product is used for distillation. Sugar is imported from Peru. Cattle, llamas, and sheep are numerous. Bolivia is rich in forests and grazing lands, but thus far their development has been very limited. Transportation is exceedingly difficult, and in addition to this the people themselves seem to have no high degree of competency. The mineral wealth is large, and includes silver, copper, tin, zinc, lead, gold, antimony, bismuth, and borax. The most important metal mined is silver, the production of which fell off in 1895 and 1896, but in 1897 was said to amount to 15,000,000 ounces. Bolivia has become, with very limited exploitation, the third silver-producing country of the world, Mexico being first and the United States second; the most important silver districts are Huanchaca and Potosi. Tin is second in importance, but the quality of the Bolivian product is not regarded as first rate—that is, equal to the tin of the Straits Settlements. The principal tin-producing districts are on the eastern cordillera of the Andes, extending a distance of 300 miles and divided into four distinct groups—La Paz, Oruro, Potosi, and Chorolque. The yearly production of concentrated ore is said to be about 4000 tons. One authority places the export of tin to European markets in 1897 at 5506 tons. A fine quality of copper is found in the Corocoro district; the annual output is about 3000 tons. Gold in small quantities exists both in quartz and in river beds; its production, however, is almost limited to washings by Indians. It was reported that the value of Bolivian mineral products exported from Antofagasta in 1898 was \$29,994,914. "The principal items were silver ore, \$17,252,792; silver in bars, \$4,357,282; silver sulphurets, \$2,620,410; tin in bars or pigs, \$1,767,714."

The principal imports are provisions, furniture, hardware, alcoholic liquors, textiles, and apparel; the exports include silver, tin, copper, rubber, wool, hides and skins, cocoa, coffee, bismuth, and cinchona. The rubber export is increasing. The ports through which Bolivian commerce passes are Arica and Antofagasta (Chile), Mollendo (Peru), and the northeastern river ports of Villa Bella and Puerto Suarez. It was announced in May, 1899, that Brazil had conceded to Bolivia the latter's claim to the Acre district. Bolivia thereupon established a customs-house at Puerto Alonso on the Acre River. This port, it is said, will afford a better outlet for rubber than the port of Villa Bella, the latter being on the Madeira, a river that offers many obstructions to navigation. The following amounts, representing bolivianos, have been reported for the total imports and exports: Imports, 1897, 24,456,000; 1898, 38,400,000; exports, 1897, 25,500,000; 1898, 18,000,000. Of the countries importing into Bolivia, Great Britain ranks first, with Germany next and France third.

Communications.—Bolivian roads are in a primitive condition and throughout the republic communications are difficult. A railway connects the frontier town of Ascotan with the Chilean port of Antofagasta. In Bolivian territory the railway runs from Ascotan to Uyuni, Huanchaca, and Oruro, a total distance of about 500 miles. Other lines have been projected, and it is thought that construction will soon begin. Puno, on Lake Titicaca, is connected by telegraph with La Paz; from

this town a line runs to Oruro, Cochabamba, and Colquechaca; and the latter town also is connected with Sucre. Another line runs from the Argentine frontier through Potosi and Sucre, connecting with the Pacific coast. The total length of telegraph lines is reported to be 2980 miles, and the number of telegraph offices 68. Bolivia belongs to the postal union and has about 328 post-offices.

Religion and Education.—There is religious toleration, but the state religion is Roman Catholic. Primary education, under control of the municipalities, is gratuitous and nominally compulsory. In 1897 the primary schools numbered: municipal, 366; private, 121; total, together with 82 industrial schools, 569, the enrolment being 36,690 pupils. In the same year, for secondary education there were 8 colleges and 9 other institutions, with 91 teachers and 2057 students. For higher education there are six so-called universities, having about 500 students. Various mission schools are taught by the priests.

The Brazilian Boundary.—Pursuant to the agreement, announced in May, 1899, by which Brazil conceded to Bolivia the latter's claim to the Acre region, a joint commission was appointed to rectify the frontier in accordance with the treaty of 1867. Pending the final settlement, Bolivia will continue the collection of customs duties at Puerto Alonso.

A Revolution.—During the fall of 1898 an electoral campaign developed into an insurrection against the government of President Severo Fernandez Alonso. The insurgents, or Federalists, who were led by Señor Macario Pinilla, minister of the interior and justice in the cabinet formed when Alonso became president in August, 1896, Señor Serapis Reyes Ortiz, prefect of the department of La Paz, and Colonel José Manuel Pando, occupied La Paz, which became the centre of the rebellion. The vote of congress that Sucre be the only and permanent capital of the republic caused the people of La Paz to rebel. The seat of government in Bolivia has been changeable; in 1892 it was at Oruro, in 1893 at La Paz, and since 1894 at Sucre. On the 17th of January President Alonso's troops were defeated and he failed in his attempt at laying effective siege to La Paz. By the last of January he withdrew from La Paz and was compelled to fall back to Oruro; about the same time it was reported that discontent was rife among his men and there were constant desertions to the insurgents, who held, besides La Paz, the cities of Santa Cruz and Potosi. Toward the last of March they captured Cochabamba, and the department of the same name declared for Pando's party. Internal disorder was aggravated by various uprisings of the Indians, some of whom looted the Corocoro mining works; these works were owned by citizens of Chile, and complications with that country seemed imminent. The revolution reached a successful termination after President Alonso had retreated to Oruro in a battle fought at that city on April 12 and lasting about an hour. According to reports, about 200 men were killed. The forces of Colonel, afterward General, Pando occupied the city, and President Alonso effected his escape to Antofagasta on the coast. The commercial interests of Bolivia suffered heavily through the revolution, and the restoration of order by Pando caused great satisfaction. On October 26, 1899, General Pando was inaugurated constitutional president of the republic, "amid the enthusiastic acclamations of congress and the people." He organized a cabinet with Señor Fernando Guadialla as minister for foreign affairs, and Señor Carlos Romero as minister of the interior.

BONAPARTE, Prince NAPOLEON CHARLES GREGOIRE JACQUES PHILIPPE, third son of Prince Lucien Bonaparte, Prince of Canino, and chief of the elder branch of the Bonaparte family, died in Rome, February 12, 1899. Prince Napoleon was born in Rome in 1835 and succeeded four years ago to the headship of the elder branch of the house of Bonaparte, on the death of Cardinal Prince Lucien. Prince Napoleon took a prominent part with Maximilian, the Austrian Archduke, in the attempt to establish a monarchy in Mexico. In 1859 he married Princess Marie Christine, daughter of Prince Jean Nepomucene Ruspoli.

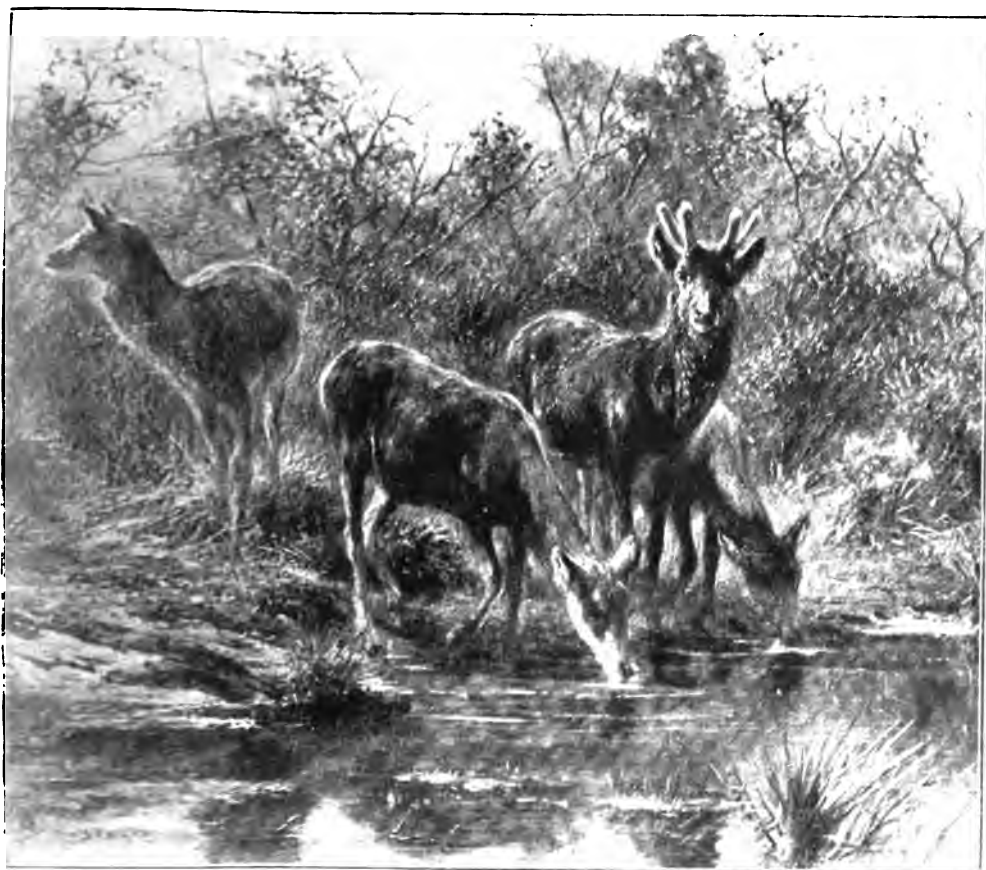
BONHEUR, MARIE ROSALIE (ROSA), celebrated animal painter, died at By, near Fontainebleau, France, May 25, 1899. Mlle. Bonheur achieved a fame unsurpassed by any woman artist, and in her own department of animal painting is placed in the front rank of painters. She was the daughter of Raymond Bonheur, a drawing teacher living at Bordeaux, and was born March 22, 1822. At an early age she gave evidence of artistic ability. This was trained and developed by her father, so that when still very young she acquired a fine technique. Mme. Bonheur died in 1833, and the father and children moved to Paris, where Rosa improved her opportunity of studying the pictures in the Louvre. The family was poor and for a time the girl was apprenticed in a dressmaker's shop, but she soon returned to her copying in the Louvre. Here she worked regularly, and not infrequently sold her pictures to advantage. At the same time she helped her father in the preparation of drawings for the publishers. In 1841 she succeeded in having two pictures exhibited

at the Salon, "Goats and Sheep" and "Two Rabbits," both pictures having been painted from living models in her father's studio. For many years thereafter she exhibited annually at the Salon. She also did some work in sculpture in her early career, and in 1845 received a gold medal of the third class, and one of the first class in 1848. In the latter year she and her brother and sister, Auguste and Juliette, as painters, and her brother Isidore, as a sculptor, exhibited at the Salon. From this period until she died Mlle. Bonheur kept what might fairly be called a menagerie, consisting of various kinds of wild, but especially of domestic animals and birds, which she used for models. At this early time also she began a minute and scientific study of animal anatomy, carried on especially at the *abattoirs*. At the Salon of 1846 she was awarded the third medal for her "Red Oxen of Cantal." She exhibited at the Salon of 1849 the first of her large canvases and one of her best, "Plowing in Nivernais." For this picture she received from the French government 3000 francs. In 1853 she exhibited another large picture, which is said to be the largest ever produced by an animal painter and for which she received all the honors of the Salon. This was her most famous work, the "Horse Fair," for which she received from Mr. Ernest Gambart 40,000 francs, and which, after passing through the hands of W. P. Wright and of A. T. Stewart, of New York, came into the possession of Cornelius Vanderbilt for the consideration of \$55,000. Mr. Vanderbilt presented the painting to the Metropolitan Museum in New York, where it now hangs. After exhibiting this painting, Rosa Bonheur was exempt from examination at the Louvre. From 1850 she lived at By. It was here in 1865 that the Empress Eugénie presented her with the cross of the Legion of Honor. Years afterward President Carnot made her an officer of the Legion, an honor held by no other woman.

About the year 1850, in order better to prosecute her work at the *abattoirs* and horse fairs, Mlle. Bonheur assumed male attire. For many years thereafter she continued to work assiduously at her anatomical studies and her painting. Among her famous works, besides those already mentioned, are: "A Limier-Briquet Hound" (1877), "Weaning the Calves," "Deer in the Forest-Twilight" (1885), all in the Metropolitan Museum; "Deer Drinking" (1877), in the Lenox Library, New York; "Sheep at the Seaside," bought by Empress Eugénie; "Lion at Home"; "Hay-making in Auvergne"; "The King of the Forest"; "The Stampede." As a painter of animals Rosa Bonheur ranks not unfavorably with Landseer. She lacked, however, the characteristics of sentiment and of humor that were his. She may be called a matter-of-fact master of technique; she lacked the qualities of fine poetic vision and of imagination. This, however, is not an adverse criticism of her work; we may assume that she realized her own strength and her limitations, for she never attempted to enter that higher sphere of art represented so well in her time by Millet, Burne-Jones, and Puvis de Chavannes. Rosa Bonheur had genius; and when to this she added untiring study and singleness of purpose she became in her own sphere an artist unsurpassed.

BONNER, ROBERT, founder of the *New York Ledger*, died at his home in New York, July 6, 1899. He was born near Londonderry, in the north of Ireland, on the 28th of April, 1824. When fifteen years of age he came with his parents to the United States and entered as an apprentice in the office of the Hartford (Conn.) *Courant*. During the next five years he mastered the printer's trade and devoted his leisure hours to study. So expert did he become in setting type that he established a record that was unbroken for many years—namely, the setting of 25,500 ems of solid type in twenty hours and twenty-eight minutes. In 1844 he went to New York, where he became proof-reader and assistant foreman in the office of the *Evening Mirror*, of which N. P. Willis, the poet, was then the editor. While in this position Bonner acted as correspondent for the Hartford *Courant* and for papers in Washington, Albany, and Boston. In 1850 he bought for \$900 the *Merchant's Ledger*. This was a journal merely of trade and finance, and was not in a prosperous condition. Bonner immediately introduced new features, and the paper gradually gained appreciation not only in the business world, but especially in the home.

In 1855 the name was changed to the *New York Ledger*, and from that time Robert Bonner showed a genius, unsurpassed in the publishing world, in issuing a paper that would catch the fancy of the "plain people." He believed in honest advertising, and this he employed in various unique ways, and to an unprecedented extent. He succeeded in persuading many of the most popular writers of his time to contribute to the *Ledger*, which became under his sagacious management one of the most popular story papers in America. The famous sister of N. P. Willis, "Fanny Fern" (Mrs. James Parton), wrote for him a story of ten columns in length, for which she received \$1000. In consideration of a gift by Bonner of \$10,000 to the Mount Vernon Association, Edward Everett contributed for a year weekly letters. Henry Ward Beecher received \$30,000 for his *Norwood*; Long-



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PAINTINGS BY ROSA BONHEUR.—1. "Deer Drinking." 2. The "Horse Fair."

fellow, \$3000 for a poem; Tennyson, \$5000 for a poem; Dickens, \$5000 for *Hunted Down*, the only work the great novelist ever wrote for an American publication. Many other writers of popular favor or permanent merit were enrolled by Bonner in his list of contributors; among these were Sylvanus Cobb, John G. Saxe, Mrs. Southworth, Leon Lewis, Harriet Lewis, William Cullen Bryant, James Parton, and Bishop Clarke, of Rhode Island. To these authors he paid what was then unprecedented prices; and the prices paid as well as the articles received he used as advertisements. So well did these and other advertisements, together with the real and constant merit of the paper, succeed, that the *Ledger* came to have a circulation of 100,000 copies. For thirty-seven years he was editor and proprietor of this paper, and amassed a fortune estimated at \$6,000,000. In middle age Bonner became a prominent horse fancier. At the time of his death he owned about fifty horses, which were kept at his stables in New York and on his farm in Tarrytown. In May, 1898, he stated that he had expended about \$600,000 on horses. He disapproved of professional racing and his stock never competed for money. Among the famous horses owned by him were Dexter, Pocahontas, Startle, Rarus, John Taylor, Edward Everett, Pickard, Maud S., and Sunol. For these last two he paid \$30,000 and \$41,000 respectively, and their respective records are 2.08¾ and 2.08¼. He gave largely to charities and was prominent in church work.

BOOTH, HENRY MATTHIAS, D.D., president of Auburn (N. Y.) Theological Seminary, died at Auburn, March 18, 1899. He was born in New York City, October 3, 1843; was graduated at Williams College in 1864, and at Union Theological Seminary three years later. From this year (1867) to 1891 he was pastor of the Presbyterian church at Englewood, N. J. Having resigned this charge, he passed a year in European travel, and then became associated with Dr. Henry Van Dyke, of the Brick Presbyterian Church of New York. In October, 1893, Dr. Booth was elected president of Auburn Seminary. Besides his executive work at this institution, upon him devolved the duties of professor of practical theology. Among his writings are *The Heavenly Vision and Other Sermons* and *The Sunrise, Noonday, and Sunset of the Day of Grace*.

BORAX. The production in 1898 was 16,000,000 pounds, valued at \$1,120,000. California continued the source of supply, important beds being located at Daggetts. The borax is mined by drifting into the hill.

BORNEO, one of the largest islands in the world, lies in the Malay archipelago, and has an area of about 300,000 square miles, being 800 miles long and 600 broad. The greater part of its territory is divided between the British and the Dutch. The population of the whole island has been estimated at 1,846,000. It was reported in 1899 that borings for petroleum had been made in several places with such success that people were beginning to regard the country as likely to become one of the richest petroleum fields in the world. The Bombay-Burma Trading Company has had such good success in obtaining petroleum that it has begun to build a refinery, and has also extended its operation to the island of Labuan. Favorable conditions have been found in the southern and eastern parts of Borneo as well, and several companies are working petroleum in those regions. There is a refinery at Balikpapan, one of the finest harbors on the coast, and at Koeti it was reported that one of the largest refineries of the world was in process of construction. Plans are made to lay out pipe-lines and invest large capital in the business. Coal, marble, precious metals, and diamonds have also been found. There is an abundance of wood and water, and the only real obstacles in the way are the climate and the scarcity of labor. The latter difficulty has been met by the importation of coolies from China and Java. The commercial development of the country is encouraged by the native sultans. The British possessions include British North Borneo and the neighboring territories of Brunei and Sarawak.

BRITISH NORTH BORNEO is governed by the British North Borneo Company, but is under a formal protectorate which was proclaimed by the British government in May, 1888. There is a governor, whose appointment must receive the approval of the secretary of state, and who is assisted in the administration by a council and by residents in the districts. The government has alienated a large part of the land for plantations. The chief products are timber, rice, sago, sugar-cane, coffee, cocoa, gambier, gutta-percha, tapioca, India-rubber, edible bird's nests, gums, sweet potatoes, and tobacco. Mineral products include gold, copper, and coal. The colony is self-supporting, and the revenue is derived chiefly from opium, sales of lands, duties, and royalties on exports. The trade is chiefly with Great Britain by way of Singapore. The colony is connected by cable with Labuan and Singapore. The chief towns are Sandakan, the residence of the governor; Gaya, Kudat, Silam, and Mempakol. There is a short railway line in process of construction from the western coast inland.

BRUNEI is also a British protectorate, but its local administration is in the hands

of a native sultan. The area is about 3000 square miles, and the chief town is Brunei, with a population of about 5000.

SARAWAK has an area of 50,000 square miles, and a population of about 300,000. It is under the government of a rajah (Sir Charles J. Brooke in 1899), and has been under British influence ever since Sir James Brooke, the uncle of the present rajah, obtained the government in 1842 from the Sultan of Brunei. It is a flourishing colony, and carries on a considerable trade in timber and jungle produce. The products are like those of North Borneo. The chief town is Kuching, on the Sarawak River.

DUTCH BORNEO comprises about two-thirds of the island, including the southern and western coast, and having an estimated area of 212,737 square miles, with an estimated population in 1895 of 1,180,578. The chief Dutch settlements are at Banjarmasin, Pontiana, Sambas, and Koti.

BORNU, an African state of the central Soudan, lying between the sultanate of Sokoto on the west and Lake Tchad on the east, with an estimated area of 50,000 square miles, and an estimated population of 5,000,000, consisting chiefly of people of mixed negro and Dasa descent, but comprising also Tuareg Berbers, Arabs, and pure negroes. Capital, Kuka (population, 50,000 to 60,000), on the west shore of Lake Tchad. It is one of the most populous of the Mohammedan states. It is under an absolute sultan or sheikh, who governs with the aid of a council of military chiefs, and has a standing army of 30,000 men. The Magomi tribes occupying central Bornu are said to be fairly advanced in the arts of civilized life, and show great skill in metal-working, weaving, and the making of pottery. Kuka is an important trading centre, being the objective point of the caravan route from Tripoli and Fezzan.

BOSNIA and HERZEGOVINA, the two Turkish provinces in the western part of the Balkan peninsula, between Dalmatia on the west and Serbia on the east. They have been administered and occupied by the Austro-Hungarian government under the terms of the treaty of Berlin in 1878. Their area, including the sanjak of Novi-Bazar, is 23,571 square miles, and their population in 1895 was 1,568,092, of whom 673,246 belong to the Oriental Orthodox Church, 548,632 are Mohammedans, and 334,142 Roman Catholics. Agriculture is the main occupation, though the methods employed are primitive, and it engaged in 1895 about 88 per cent. of the whole population. The soil is fertile, and the chief products are wheat, maize, barley, oats, rice, millet, buckwheat, potatoes, flax, and hops. More important than any of these is tobacco, which is a government monopoly. Fruit is raised in both provinces in abundance, and in Herzegovina there is a small production of wine. The mineral resources are considerable, and the government is making efforts to develop them. Coal is the main mineral product, but copper, manganese, chromium, quicksilver, ammoniac soda, and salt are also mined. Cattle-raising occupies a large part of the population, and silk-culture and the production of beet sugar are carried on to some extent, and about 45 per cent. of the land is under forests. Recent years have been marked by a rapid economic development. In 1887 the annual budget amounted to only 9,000,000 florins, while the budget estimates for 1899 were: Receipts, 19,549,250, and expenditures, 19,496,780. The receipts are chiefly from indirect taxes, which were estimated to yield 10,200,000 florins in 1899. The estimate from the direct taxes in 1899 was 5,500,000 florins. Under the encouragement of the government manufactures have increased in the last few years. Railway-building had also advanced very rapidly. In the decade 1886-96, the railway lines increased from 402 kilometres to 708 kilometres, and from 1896 to 1899, 306 more kilometres were built. The government is now preparing to build a long line connecting important military points which, upon completion, will unite Dalmatia with the interior, and indirectly with Hungary. Another sign of increasing business activity is the establishment of financial institutions. There is a native military force of 5185 men on a peace footing, and the Austro-Hungarian army of occupation is about 23,000 strong. The administration is directed by the imperial government of Austria-Hungary through the Bosnian bureau, at the head of which is the imperial minister of finance at Vienna. Sarajevo, the capital, is the seat of the provincial government, which consists of the three departments of finance, internal affairs, and justice. The executive is aided by an advisory board consisting of the prelates of Sarajevo and twelve representatives of the people.

BOSTON PUBLIC LIBRARY, a system of libraries in the city of Boston, Mass., comprising a central library building in Copley Square, 10 branch libraries with independent collections of books, situated in different parts of the city, and 19 stations which have deposits of books from the central library. Besides these the central library delivers books to 7 public schools, 16 reformatory institutions, 23 fire companies, and 1 post-office. This library handles a greater circulation of books than any other library in the world, receiving applications for books from persons

in many of the Eastern States. The buildings and grounds represent an outlay of \$5,000,000. The central library building is decorated with works of art of a high order. The endowments for the purchase of books amount to \$218,000, besides \$50,000 for the purchase of newspapers. In 1899 the number of books in the library was 735,168, the number of persons drawing books was 64,478, and the number of persons visiting the library was over 2,000,000. The library is open from 9 A.M. to 10 P.M.

BOTANY. The present article is intended to convey some idea of the more important features connected with the botanical progress during the year 1899. It should be stated at the outset that so far as questions of botanical research are concerned, the past year has not been marked by striking discoveries, but the work done, nevertheless, constitutes valuable contributions to knowledge and may be expected to bear mature fruit later. There is, however, considerable interest and activity being manifested in the United States in the subject of teaching botany, as is evident from the large number of text-books issued during the past and previous year. The methods of studying botany, so prominently advocated by our most recent text-books, must be considered of a transitory rather than permanent nature, and it would not be surprising if the following year should witness something of a reaction toward some of the methods advocated in the latest acquisition to teaching botany. The number of publications embodying original work are rapidly increasing each year, especially in the United States, where modern research methods have become firmly established.

The utilitarian side of botany has developed in the United States to a greater extent within the past few years than in any other country, and there is a vast amount of economic literature published annually, the past year being no exception. This can be traced to the establishment of a large number of agricultural experiment stations and technical institutions a few years ago, which are becoming year by year better equipped, and are turning out more work of a high order; and to the fact that the inherent practical nature of the American mind demands that science shall go with practice. The enormous resources of the United States and the wealth which they represent make scientific investigation of a practical nature very desirable.

Pedagogics.—The enormous strides that have been made in botanical teaching within the last decade have completely changed the course of study in our schools and colleges, as a result of which a great variety of text-books of a totally different character from those which were in use previously have made their appearance. The introduction of nature study into our secondary schools is responsible more than anything else for the unusual abundance and unique character of our modern botanical text-book. The emphasis given to the questions, What, How, and Why of plant phenomena in the secondary schools has led authors of botanical text-books to pay considerable attention to these questions in our colleges and universities. As a consequence of the thorough hold which these questions have upon modern methods of teaching, such subjects as morphology, physiology, and ecology, or, in other words, form, function, and the influence of the environment, have received special attention in our more recent text-books of botany.

The past year has witnessed considerable activity in the publication of new text-books relating to botany which especially predominate in ecological matter or questions relating to the influence of the environments upon plants. Then, again, there are a host of general works upon botanical subjects that have appeared. There are undoubtedly a larger number of elementary popular works touching upon botany, such as readers for secondary schools, illustrated floras, folklore of plants, etc., that are published each year, than in any other branch of natural science. Some of the more important text-books and elementary guides for teachers that have been issued during the past year are as follows: *The Teaching Botanist*, by W. F. Ganong, representing a series of essays touching upon all of the modern phases of teaching; *Plant Relations*, by J. M. Coulter, representing, as its name implies, a work in ecology (a second volume, entitled *Plant Structure*, is to be issued shortly; this is the first attempt to present ecology or plant relations so extensively in an elementary text-book and to have it precede structure); *An Elementary Text-book of Botany*, by S. H. Vines, being a smaller edition of his *Student's Text-book*, issued a few years ago; *Seed Dispersal*, by W. J. Beal, intended to help young botanists and teachers; *Flora of Southern States*, by S. M. Tracy, especially designed to supplement *Bergen's Text-book of Botany*; *The Corn Plants: Their Uses and Ways of Life*, by F. L. Sargent, a reader and teacher guide; *Strassberger Noll. Schenck, and Schimper Text-book of Botany*, fourth edition.

Systematic Botany.—The progress made in the study of genera and species during the past year has been equal to that of the preceding year. Unfortunately, however, confusion still exists in phænogamic nomenclature, and this feature cannot be conducive to the welfare of this branch of botany, neither is it to botanists in general,

who are frequently dependent upon technical names of plants. The greatest energy during the past year in systematic work has been expended upon the study of African, western North American, and Central and South American plants. Among others who have been active in this line of work may be mentioned the following: The North American species of higher plants, exclusive of Mexican, have been studied by G. V. Nash, M. L. Fernald, E. P. Bicknell, B. L. Robinson, K. M. Wiegand, A. Nelson, W. A. Setchell, P. H. Rhyberg, T. S. Brandegee, J. M. Coulter, C. S. Sargent, J. K. Small, E. Nelson, E. L. Greene, A. M. Vail, R. I. Cratty, F. L. Scribner, A. A. Heller, J. S. Smith, and C. D. Beedle. Mexican and South and Central American plants have been described by B. L. Robinson and J. M. Greenman, J. D. Smith, J. N. Ross, W. W. Rowlee, R. Pilger, F. Kränzlin, F. Pax, P. Dietel, F. W. Heger, and F. Buchenau. The species of the West Indies have been studied by Urban, Lindau, and Schlechter. The African plants have been studied by A. Engler, who has published two parts of his African flora, which represent the first attempt to classify this little known region. Engler points out that there exists a striking relationship between the forest flora of Africa and tropical America; a less striking relationship with the tropical Asiatic forests; an important difference between the forest floras of East and West Africa, and an evident difference between the Abyssinian forest flora and that of the rest of tropical Africa. Among other contributors to our knowledge of the African flora may be mentioned G. Lopriore, W. Rhuland, R. Schlechter, E. Hackel, H. Schinz, H. Hallier, and A. Pestalozzi. F. Reinecke has published a flora of the Samoan Islands. New species of North American fungi have been described by C. H. Peck, E. D. D. Holway; new ferns by L. M. Underwood; a monograph of the Californian *Hepaticæ* by M. A. Howe, and a conspectus of the genus *Lilium* has been presented by F. A. Waugh. The fourteenth volume of *Saccardo Sylloge Fungorum* is now completed, which brings this work fairly well up to date. The present year also marks the completion of Vols. II-IV. of Engler and Prantl's *Pflanzenfamilien*, which constitutes the most important work in systematic botany in recent years.

General Morphology and Histology.—The structure of the embryo sac in *Sparganium* and *Lysichiton* has been studied by D. H. Campbell. The author points out the resemblance of the antipodal cells of *Lysichiton* to certain compositæ, and he no longer regards these cells as merely vestiges of the primitive prothallial tissue, although they may represent this tissue, but on account of their greater development in these types he maintains that they possess an important physiological function. Recent investigation by Oltmanns upon *Ectocarpus siliculosus*, a species of marine algæ, have led him to abandon his former position in regard to the non-fusion of zoospores. He maintained that what Berthold saw and described as fusion of the zoospores was in reality infusoria capturing and devouring the zoospores. He now admits his mistake, and maintains that Berthold's conclusions are correct.

No group of the *pteridophyta* possesses a life history so little known as the *lycopodiaceæ*, and a paper upon the *Prothallus* of *Lycopodium Clavatum*, by W. H. Lang, possesses some botanical interest. The prothallus of this species was found below the surface of the ground, where it passes a purely saprophytic existence, and during a certain stage of its development it is intimately associated symbiotically with mycorrhiza. The author presents a discussion of the relationship existing between the *lycopodiaceæ* and *pteridophyta* from the knowledge we possess of their life history. Another paper has appeared during 1899 which treats of a group belonging to the vascular cryptogams and is entitled *Equisetum and Its Allies*, by E. C. Jeffrey. The author concludes that *equisetum* is more closely related to the club-mosses than to the ferns. Under the title of *Propagation of Mosses by Asexual Organs*, C. Correns has given the results of a large number of experiments on the propagation of mosses by cutting, etc., together with a morphological study of the brood organs. The development of the *microsporangia* and microspores of *Hemerocallis fulva* has been studied by E. L. Fullmer. The origin of the *sporangium* is pointed out and bipolar spindles are described. The structure and development of *Cryptomitrium tenerum*, a Californian liverwort of rare occurrence, is described and illustrated by Le Roy Abrams, and its relation to other genera is pointed out. The interest shown in the question of sexuality of lichens has always been quite marked on account of the meagre knowledge which we possess of this group of plants. Some years ago Stahl announced the discovery of sexuality in collema, a gelatinous lichen, but the nature of this process has been for many years quite imperfectly known, and even the authenticity of Stahl's observations has been doubted. Baur, however, has recently confirmed Stahl's original observation, and he has been able to add very much to our knowledge of the sexual organs. Other noteworthy contributions to morphological literature during the year are: *A Morphological Study of Podophyllum peltatum*, by T. Holm; *The Origin of*

the Leafy Sporophyte, by J. M. Coulter; *Anatomy of the Dicotyledons*, by H. Solereder, and a popular work by Sir John Lubbock on *Buds and Stipules*.

Vegetable Physiology.—The number of papers relating to physiology during the past year have been numerous, and have dealt with many interesting and important matters which cover a wide range of subjects. The phenomena of coloration in leaves have been studied by Overton, who found that the red cell sap is connected with a rich content in sugar; that low temperatures induce red coloration, and that the red coloration in many winter leaves, the reddening of many fruits, and the deeper coloration of Alpine plants may be due to an increase of sugar at the expense of starch.

The penetrating power of fungi has been further investigated by Lind, who has shown how fungi pass through bone, limestone, and even crystals by the secretion of carbonic and oxalic acid. This action is dependent upon chemotropic stimuli, which is usually furnished by some organic or inorganic food material.

Nordhausen has investigated the question of infection of plants by fungi. He has been able to show that certain fungi (*hemisaprophytes*) cannot gain entrance to the plant without nourishment additional to that contained in the spore. He maintains that the spores during germination secrete a substance that digests the cell-wall, thus producing a soluble substance which attacks the germ tube chemotropically. There is later produced a toxic which kills the protoplasm and allows the fungus to thrive saprophytically. Both of the preceding papers contain data which from our present knowledge we naturally anticipated, and while they are purely of an uneconomic nature they constitute welcome contributions which will be useful in the study and treatment of plant diseases. The careful investigations of Kolkwitz on the respiration of fungi (*aspergillus*, *penicillium*, *bacteria*) as influenced by electric light showed an increase in the respiration of about 10 per cent, which is quite contrary to what might be expected. F. C. Newcombe has investigated the subject of cellulose enzymes. He finds that they act upon starch very feebly and upon reserve cellulose so energetically, that they must be regarded distinct from diastase. Contribution to our knowledge of symbiosis and saprophytism has been made by D. T. MacDougal. He recognizes two distinct types of *Endotropic mycorrhiza*—namely, one adapted to nitrogen fixation, and a second for the absorption and modification, perhaps oxidation, of humus products by the fungus, and their liberation in the tissues of the host plant. The greater number of examples he found are included under the last type. The peculiar effects of centrifugal force upon cells of certain plants have been brought out by D. M. Mottier. He employed a centrifugal force equal to 1800 times that of gravity and found in the cases of mosses, algæ, and phanerogams that the movable plastic contents of the cells were made to fall into a compact mass at the end of the cells. In cells which were not killed outright the displaced cell-contents gradually redistributed themselves. He observed in dividing cells of certain algæ that centrifugal force caused the cell-wall in the process of formation not to be completed. In the case of the corn (*Zea maise*) the nucleolus was thrown out of the nuclei membrane into the cytoplasm, from which they never returned. B. Hansteen has shown that light in general, at least, plays no direct rôle in the synthesis of proteids in the bodies of green plants. Important investigations upon the toxic effect of deleterious agents in the germination and development of certain fungi have been made by J. F. Clarke. The extensive summary given makes it impossible to go into details concerning the results which he obtained. He shows, however, that fungi are more sensitive than higher plants, and that different species as well as particular forms of the same species present great differences of sensitiveness to reagents. Experiments of this nature have a practical bearing upon vegetable pathology, inasmuch as the application of fungicides have a wide range at the present time. The remarkable strides made in physical chemistry of late years render it possible for us at the present time to place our crude knowledge of fungicides and insecticides upon a scientific basis.

The influence of intense cold produced by liquid hydrogen on the germination of seeds has been tested by Dewar. It was found that whether the seeds were immersed in the liquid hydrogen without protection, or whether they were cooled in sealed tubes, they germinated even when exposed to a temperature of 250° C. for one-half hour.

The power of one organ to perform the function of another in case of need is well known. Vöchting has published a treatise giving the result of his studies upon correlation in organs and tissues. He has demonstrated that a tuber may replace a stem if put in such a position that its normal function is interfered with, or a tuber may develop from almost any organ if the normal function of the tuber is suppressed. He showed, for example, that by darkening the hypocotyl of radishes with tin-foil that tuberous swellings occurred at the places darkened. The influence of external factors as affecting the configuration of plants are fully discussed, and

the author thinks that not only the internal forces which concern the propagation of the species is responsible for this phenomena, but is also due to a demand for organic symmetry. The experiments are especially notable in showing the great plasticity of plants.

The influence of physical and chemical factors upon the reproduction of *saprolegnia*, a water mould, has been investigated by Klebs. He has shown that this species will grow indefinitely without either sexual or asexual reproduction if nourishment be abundant. If, on the other hand, the hyphæ are starved, the extensive formation of zoospores takes place. This author found that by varying the concentration of the nutritive medium, the fungus can be made at will to assume a purely vegetative condition. He maintains that there is no inherent tendency toward alternation of generations, although the conditions in nature are such that an alternation of generation is usually brought about through the exhaustion of the nutriment.

Some of the more important hand-books and text-books touching upon physiology which have appeared during the past year are as follows: *General Physiology*, by Max Verworn; *Experimental Morphology*, Pt. II., by C. B. Davenport; *The Soluble Ferments and Fermentation*, by J. R. Green; *The Chemical Energy of the Living Cell*, by O. Loew.

Ecology (Life Relations).—The interest manifested in this comparatively recent division of botany—namely, the study of the life relations of plants—is increasing each year and represents an attempt to correlate some of the data which morphological and physiological investigations have brought out during the last few years. To the investigations of Darwin, however, more than any one else, does ecological study owe its inspiration.

Some of the more important contributions to ecology during the year are as follows: A work which marks a period in ecological development appeared at the beginning of the year, and is entitled *Plant Geography*, by A. F. W. Schimper, a treatise founded upon a physiological basis. The exhaustive and original manner in which plant relations are treated in this work is destined to make it a classic. Some years ago Müller published a treatise upon the fertilization of flowers by insects, and a similar hand-book, based upon Müller's work and termed *Flower Ecology*, has been written by P. Kunth. This work, which consists of two volumes, brings the data bearing upon the relationship existing between flowers and insects fairly up to date. Further contributions to our knowledge of the relations existing between flowers and insects have been made also by C. Robertson and J. Plateau. There has been a marked tendency of late years to discredit the ideas held by Müller, Lubbock, Darwin, and others in regard to the colors of flowers being the principal attractive agent to insects, and Plateau has endeavored to show in the case of *salvia* and *hydrangea* that insects are attracted to these flowers regardless of their color, inasmuch as when the showy floral envelopes were removed insects were attracted to them just the same as when the floral envelopes were present.

E. Warming has published an interesting ecological description of the vegetation of tropical America, which is the result of two visits—one to Brazil and one to Venezuela. He divides the vegetation into three parts—namely, the forests, the scrub or thorny vegetation, and the savannas or campos.

A work representing an extensive ecological study is entitled *The Ecological Relations of the Vegetation on the Sand Dunes of Lake Michigan*, by H. C. Cowles. The writer shows that the dunes of Lake Michigan have been determined largely by westerly winds. He finds important differences between the vegetation of the beaches washed by summer waves and those washed by winter waves, and gives a list of the most successful dune-forming species of plants.

W. Meyer has studied the influence of weather and the condition of the soil upon the anatomical structure of plants when growing under normal conditions. He compares numerous members of the same family, chiefly Alpine plants, and shows how species in different divisions of the same family possess a close resemblance to one another when growing in similar situations. For example, certain species of the *caryophyllaceæ*, belonging to different genera, growing in desert regions, resemble each other, as also do those growing in Alpine regions, while, on the other hand, plants of the same species, as is well known, show a marked difference when growing under various conditions. Meyer maintains that common origin does not explain this phenomenon, but it is due to environmental factors or life relations.

The adaptation of leaves to the intensity of light has been studied by J. Wiesner. He shows how vegetation in forests, and, in fact, all plants which grow in deep shade, possess leaves that adapt themselves to obtain the maximum amount of diffused light. The light absorption of a plant is the relationship of the intensity of light at the spot where the plant grows.

The influence of sun and shade upon vegetation is still further shown by M. Berthelot's investigations. By comparing the dead weight and the chemical composition of the ash of plants grown in the shade and fully exposed to the sun he found that

the richness of carbon in a plant is the greatest when developed in the sun and least in the aftermath. Phosphorus and sulphur, on the other hand, are present in the largest quantities in plants grown in the shade.

Vegetable Pathology.—The amount of investigation relating to the diseases of plants is at the present time so large that a number of special publications are devoted to this subject alone, besides numerous bulletins treating of plant diseases are issued from the various experiment stations throughout the world. The attention, however, given to this subject in the United States at the present time far exceeds that of any other country, and especially is this true in regard to remedial measures. The following brief reference to a portion of the works relating to the pathology of plants can only be presented here.

Investigation made by A. F. Woods has resulted in showing that a so-called disease of the grape vine, described some years ago by Viola and Sauvageau, is not a disease at all; but the abnormal condition which they observed in the cells, and supposed to be due to a parasitic organism, can be produced by reagents. He has been able to produce precisely similar results in the lily, tobacco, rose, hyacinth, and even in *spirogyra* cells by the use of certain staining reagents.

A disease known as sorghum blight has been found by M. Radius to be caused by a species of yeast. His material was obtained from Algeria, and while he does not maintain that the conclusions reached by Burrill, Kellerman, and Swingle in this country are incorrect, in so far as the disease is caused by bacteria, he does maintain that the red condition of affected sorghum plants is due to the presence of yeast.

A bacterial disease of the sugar-beet has been worked out by Clara A. Cunningham. It was shown that the germ is able to break down cellulose, hence its capability of spreading from one cell to another. The disease is said to be dependent primarily upon drought and successive low temperatures.

Apple canker, which attacks the bark of the limbs of apple-trees of all ages, has been traced by W. Paddock to be caused by the action of the fungus *Sphaeropsis malorum* Pk., which is the same fungus that causes the black rot of apples. The disease is also peculiar to pears and quinces, and in most cases proceeds from the smaller branches to the trunk, not infrequently killing the tree.

E. F. Smith has published a comprehensive account of *The Wilt Disease of Cotton, Watermelon, and Cow-Pea, as Occurring in the Southern United States*. A five years' investigation of the disease shows that it is caused by a fungus, which penetrates and clogs the vessels, hence shutting off the passage of water from the soil to the aerial parts of the plants. The fungus causing this disease appears to be a new one, and the author has created a new genus for it.

Some other publications relating to pathology are as follows: *A New Rice Smut*, by A. P. Anderson; *A Horn-Destroying Fungus*, by H. M. Ward; *A New Pansy Disease*, by R. E. Smith; *Studies of the Life Histories of Rusts*, by E. Fisher; *Cereal Rust of the United States*, by M. A. Carleton; *A Fat-Destroying Fungus*, by R. H. Biffen; *The Potato Bacteriosis in St. Petersburg*, by K. S. Iwanoff; *Fungus Diseases of the Sugar-Beet and Peach Leaf-Curl*, by B. M. Dugger; *Leaf Scorch of Sugar-Beet*, etc., by F. C. Stewart; *A Soil Bacillus of the Type of De Bary's B. Megatherium*, by W. C. Sturgis.

Cytology.—The study of the cell (cytology), which was so energetically begun by Strassberger and others a few years ago, has received much attention the past year. It would appear from the number of publications of an elaborate character that this subject receives its full share of attention in the United States at the present time. The importance which is attached to the questions of heredity and variation at the present time renders cytological investigation a fascinating study, although it must be confessed that the prospect of solving hereditary problems by means of histological technique and microscopical observation seems as remote as it did a decade ago. The present time, however, is not opportune to present a retrospective view of cytological results, hence a brief *résumé* of some of the papers relating to this subject will follow.

A paper discussing the possible function of the nucleolus in heredity has appeared from H. H. Dixon. He reviews the various theories in regard to the organs which bear the hereditary qualities, and offers evidence which seems to show that the nucleolus may possibly be the transmitter of heredity.

Under the title *Oogenesis in Pinus Laricio*, C. J. Chamberlain presents his results of a study of the oosphere. From his observations it appears that non-support is thus given to the theory that the ventral canal cell is the homologue of the egg. The karyokinetic division of the nucleus of *Allium cepa* has been further investigated by Némec. He takes exception to the view held by Mottier, Osterhout, and others, in regard to the multipolar achromatic spindle, but believes it to be bipolar from the beginning of its formation. He describes certain fibres connected with the chromosomes, which, he maintains, are entirely different in structure from those first formed in the spindles. Any statement concerning their function, he maintains, would be

mere speculation, but suggests that they may assist the fibres connected with the chromosomes. Nawaschin and Guignard have investigated the peculiar behavior of the male cells in *Lilium martagon*. Of the two male nuclei, they observed that one fuses with that of the egg, while the other, probably the first one to leave the pollen tubes, fuses with one of the pollen nuclei. The male nuclei are described as long, twisted bodies, many of which present appearances suggesting possible motility. They appear, however, to be devoid of cilia, but are considered, nevertheless, *antherozooids*.

A cytological paper by Farmer and Williams deals with the life history and cytology of the *fucaceæ*. These investigations have brought out many interesting points, among others of which may be mentioned the mode of attachment of the spermatozoids; the sodden appearance of conical projections on the surface of the egg, together with the simultaneous repulsion of the supernumerary spermatozoids. The authors consider the phenomena of repulsion of the spermatozoids as marking the moment of fertilization. F. L. Stevens has discovered that the oosphere of *Albugo bliti* is a compound oosphere in that it contains several functional sexual nuclei. This constitutes the first discovery of a compound oosphere either in the vegetable or animal kingdom. A recent paper upon the cytology of *Achlya Americanum*, by A. H. Trow, has brought out some criticisms from Hartog regarding the long-debatable question as to whether fertilization takes place in the group of plants known as the *Saprolegniaceæ*. Trow is convinced that fertilization does take place, while Hartog, together with many other botanists, believes that it does not.

Among other noteworthy cytological papers may be mentioned those of B. M. Davis, who has presented his studies of the spore mother cell in *Anthoceros*, and the results of a critical study of the reduction which takes place in the nucleus of *Arisæma triphyllum* and *Lilium grandiflorum* have been published by G. F. Atkinson. A recently issued handbook, entitled *Cytological Technique*, by E. Fischer, contains a description of the latest methods in cytological study.

General Botanical Works Issued During the Year.—*A Glossary of Botanical Terms*, by B. D. Jackson; *Fossil Botany*, Vol. II., by A. C. Seward; *A Manual of Botany*, by David Hauston; *Handbook of Practical Botany*, by E. Strassberger; *The Botanists of Philadelphia and their Works*, by J. W. Harshberger; *Moulds, Mildews, and Mushrooms*, by L. M. Underwood; *The North America Slime Moulds*, by T. H. MacBride; *How to Know the Ferns*, by F. T. Parsons; *A Guide to the Wild Flowers*, by Alice Lounsberry; *The Evolution of Plants*, by D. H. Campbell; *Field, Forest, and Wayside Flowers*, by Maud Goings; *The Grasses, Sedges, and Rushes of the Northern United States*, by E. Knobel.

Organizations.—Section G (Botany) American Association for the Advancement of Science met at Columbus, O., August 21-26, 1899. The officers for 1899 were as follows: Vice-president, C. R. Barnes; secretary, W. A. Kellerman. Thirty-three papers were read. Wednesday, August 23, was designated Sullivant Day, and was used to commemorate William S. Sullivant (died 1873) and Leo Lesquereux (died 1888), two able bryologists. Vice-president C. R. Barnes delivered an address on the *Progress and Problems of Plant Physiology*. The officers for 1900 are as follows: Vice-president, William Trelease; secretary, D. T. MacDougal.

Botanical Society of America. Fifth annual meeting held in Columbus, O., in connection with the American Association for the Advancement of Science. The officers for 1899 were as follows: President, L. M. Underwood; vice-president, B. L. Robinson; treasurer, Arthur Hallock; secretary, G. F. Atkinson; counsellors, C. E. Bessey, W. P. Wilson.

The address of the retiring president, N. L. Britton, was on *The Development of the New York Botanical Gardens*. Eleven papers were read and four new members were elected. The officers elected for the following year, 1900, are as follows: President, B. L. Robinson; vice-president, B. D. Halsted; treasurer, A. Hollock; secretary, G. F. Atkinson; counsellors, B. T. Galloway, D. P. Penhallow.

Botanical Club of the American Association for the Advancement of Science. Officers for 1899 were as follows: President, B. D. Halsted; vice-president, F. H. Knowlton; secretary, Stewardson Brown. Twenty-six brief communications were presented.

The officers for 1900 are as follows: President, F. S. Earle; vice-president, A. D. Selby; secretary, F. E. Lloyd.

The three preceding societies meet as usual with the American Association for the Advancement of Science during the summer of 1900 at New York.

Society for Plant Morphology and Physiology held its third annual meeting at New Haven from December 26-29, 1899. Twenty-nine titles of papers were presented, and the retiring president, J. M. Macfarlane, gave an address upon *Current Problems in Plant Cytology*. A number of new members were elected. The officers for 1899 were as follows: President, J. M. Macfarlane; first vice-president, G. F.

Atkinson; second vice-president, D. P. Penhallow; secretary and treasurer, W. F. Ganong.

Those for 1900 are: President, D. P. Penhallow; first vice-president, R. Thaxter; second vice-president, E. F. Smith; secretary and treasurer, W. F. Ganong. The next meeting will be held at Baltimore, Md., in connection with the *American Naturalist*.

Journals.—Besides the customary journals, there has appeared a new publication during the past year, entitled *Rhodora*, which is devoted to New England botany. This is published by the New England Botanical Club, a recently established society, and is edited by B. L. Robinson, of the Gray Herbarium, Cambridge, Mass.

Necrology.—W. Nylander, Grant Allen, Charles Naudin, A. W. Chapman, Otto Bückeler, Robert Combs, Karl Müller, R. Yatabe, A. Schmidt, Paolo Much di Palmstein, P. V. A. Feuillebois, T. Caruel, Fr. Gay, C. Flagey, C. Kaurin.

BOTTEGO EXPEDITION. See ZOOLOGICAL LITERATURE (paragraph Special Treatises).

Boulton, Charles Arkoll, Liberal senator in the Dominion Parliament, was born at Cobourg, Ontario, in 1841; died at Shellmouth, Manitoba, May 18, 1899. He is remembered as one of the Canadians who were sentenced to death by the Riel rebels in 1870. In the second Riel insurrection (1885) he raised and commanded a corps of mounted riflemen known as Boulton's Scouts. He became a senator in 1889.

Bourgeois, Léon Victor Auguste, French statesman, born in Paris May 21, 1851; was educated at the Lycée Charlemagne and became a doctor of laws. In 1876 he entered the office of public works, became sous-préfet of Rheims in 1880, and préfet of the department of the Tarn in 1882. For conciliating the miners during a strike at Carmaux he received the decoration of the Legion of Honor. He was appointed préfet of the Haute-Garonne in 1885, and in the following year returned to Paris to the ministry of the interior. In 1887 he became préfet of police, and in 1888 entered the chamber as deputy for the Marne. In 1888-89 he was under-secretary of state to the minister of the interior, and in 1890 he became minister of the interior on the resignation of M. Constans. In the same year he was made minister of public instruction, and he held this post until 1892, when he became minister of justice. In 1895 he tried to form a Radical cabinet, and was prime minister in 1895-96. In 1898 he was made minister of public instruction in the Brisson cabinet, and in 1899 was the head of the delegation from France to the Czar's Peace Conference at The Hague.

Bowdoin College, at Brunswick, Me., was founded in 1794. In his report for the academic year, 1898-99, President Hyde said that in all departments the college was in a healthful and promising condition. The year marked the adoption, in permanent form, of the elective system, toward which the college had been steadily advancing during the past dozen years. During the year five members of the faculty formed clubs, composed of members of their classes, for the discussion in a friendly and informal way of topics connected with their departments, and the influence of these clubs in starting the students in lines of scholarly interest, and connecting college study with the life of the outside world, was found to be of substantial value. The gifts to the library aggregated 884 volumes. For statistics see UNIVERSITIES AND COLLEGES.

Bowen, Sir George Ferguson, British colonial official, died February 21, 1899. He was born in 1821; was educated at Charterhouse and at Trinity College, Oxford, becoming a fellow of Brasenose in 1844. From 1854 to 1859 he was secretary of the British Government in the Ionian Islands, and was associated with Gladstone in the latter's commission appointed to make inquiry into the constitution of the islands. He was governor of Queensland, 1859-68; in the latter year he succeeded Sir George Grey as governor of New Zealand; in 1873 he was transferred to the governorship of Victoria; in 1879, to Mauritius; in 1883, to Hong Kong. In 1887 he retired from active service, but the following year was appointed royal commissioner at Malta to arrange for granting to the island a constitution. In 1886 he became a privy councillor. He wrote *Ithaca*, 1850; *Mt. Athos, Thessaly, and Epirus*, 1852; *Thirty Years of Colonial Government*, 1889.

Bowen, Herbert Wolcott, United States minister to Persia, was appointed to this position April 18, 1899, to succeed his brother-in-law, Mr. Arthur S. Hardy, transferred to the embassy at Athens. Mr. Bowen is a son of the late Henry C. Bowen, proprietor of the *New York Independent*, and was born in Brooklyn, N. Y., February 20, 1856. He studied at the Brooklyn Polytechnic Institute, in Paris and Berlin, and was a member of the class of 1878 in Yale, but was not graduated. Having been graduated at the Columbia Law School in 1881, he practised law in New York. In 1890 he was appointed by President Harrison consul at Barcelona,

became consul-general under President Cleveland, and was retained by President McKinley, serving until the outbreak of the war in 1898. Mr. Bowen has written: *Verses; In Divers Tones; Losing Ground; De Genere Humano; International Law.*

BOWLING. Bowling on alleys is largely practised in the United States, and the annual tournaments held are innumerable. On February 5 the Greater New York team established a Western record in a match with the Chicago Bowling League by rolling 1039, which they bettered on February 14 by bowling 1045, at Fostoria, O. Rose Murray broke the women's record by rolling 220 pins, February 24, at Toledo; Mrs. Edward Fries bowled 226 pins, a still better record, March 14, at Brooklyn. A telegraphic match was held in January between the Boston Athletic Association (9974) and the Crescent Athletic Club, Brooklyn (9589). The Empire Club, in a Harlem (N. Y. C.) league game, on November 27, scored 1103, which is the competition record since the adoption of the 2-ball game by the American Bowling Congress. Seven players are credited with making the maximum score (300) during the year. The American National Tournament, October 3, 1898, to January 17, 1899, was won by Albion Club, followed by Morningside, Lotus, Fidelia, Arlington, Corinthian, etc.; high scores: Morningside, 1058; Rosedale, 1045; Corinthian, 1030; Bleecker, 1025. The American Bowling Congress met at Brooklyn on January 10, and elected Dr. H. Timm, New York, president; W. V. Thompson, Chicago, vice-president; Samuel Karpf, New York, financial secretary; Thomas Curtis, New York, recording secretary; J. P. Strack, Astoria, N. Y., treasurer.

BOXING AND WRESTLING. The contests to decide the amateur boxing and wrestling championships are annually held under the auspices of the Amateur Athletic Union, which aims to maintain this form of exercise and skill at as high a plane as possible. In 1899 the boxing events were won as follows: 105-pound class, David Watson, Paterson, N. J.; 115 pounds, William Wildner, New West Side A. C., New York; 125 pounds, John Burns, of the same club; 135 pounds, G. Jansen, Pastime A. C., New York; 145 pounds, Percy McIntyre, of the same club; 158 pounds, A. McIntosh, N. W. S. A. C.; heavyweight class, J. B. Knipe, P. A. C. The wrestling contests were won as follows: 105-pound class, W. Nelson, St. George's A. C., New York; 115 pounds, Robert Bonnett, Jr., Turn Verein, Newark, N. J.; 125 pounds, M. Wiley, Rochester A. C., who also won the 135 pounds and the 145 pounds events; 158 pounds, A. Mellinger, St. Bartholomew A. C., New York.

BOYD, ANDREW KENNEDY HUTCHINSON, D.D., LL.D., a prominent clergyman of the Church of Scotland, died March 1, 1899; he was born at Auchinleck, Ayrshire, Scotland, November 3, 1825; was educated at Ayr Academy, King's College (London), and the University of Glasgow. He studied law and became a member of the Middle Temple; then became assistant minister at St. George's, Edinburgh; was minister at Newton-on-Ayr, at Kirkpatrick-Irongray, and at St. Bernard's, Edinburgh. He became first minister of St. Andrew's in 1865. In 1895 he was made a fellow of King's College, London. Dr. Boyd wrote over the pen name A. K. H. B. His published volumes number thirty-two. Among them are: *The Recreations of a Country Parson*, a series of entertaining and humorous essays; *The Critical Essays of a Country Parson*; *The Graver Thoughts of a Country Parson*; *The Commonplace Philosopher in Town and Country*; *Sunday Afternoons at the Parish Church of a University City*; *Twenty-five Years of St. Andrew's*; *St. Andrew's and Elsewhere*; *The Last Years of St. Andrew's*.

BOYD, Colonel DAVID FRENCH, ex-president of the Louisiana State University, died in Baton Rouge, May 27, 1899. He was born in 1835; was graduated at the University of Virginia in 1860, and during the Civil War served in the Confederate army. In 1875 the Khedive of Egypt selected him as superintendent of the Royal Military School at Cairo; subsequently he returned to America and accepted the presidency of the Louisiana State University. Still later he was at the head of military schools in Michigan and Kentucky, and for a time served as president of the Alabama Agricultural and Mechanical College. He returned to the Louisiana University, where at the time of his death he was professor of philosophy.

BOYLE, ROBERT, British major-general, retired, died October 31, 1899. Born July 20, 1823, and educated at private schools, he entered the light infantry in 1841. He participated in the storming of Sepapaqui, and was present at the surrender of forts San Carlos and Castello Viego, Nicaragua, in 1848. Boyle was active in the China war of 1856-58, taking part in the battle of Fatshan, the storming of Canton, and the capture of the Bogue and Taku forts, and of Peiho. He received decorations for various meritorious services, was promoted to major and lieutenant-colonel, was created a C.B., and on his retirement was made a major-general.

BRADFORD, Rev. ARTHUR D., one of the early abolitionists, died in Newcastle,

Penn., January 21, 1899. He was born in 1809, and was a direct descendant of Governor Bradford of Plymouth. Mr. Bradford was United States consul-general at Amoy, China, under President Lincoln. He had travelled widely. Until a few years ago he was a well-known contributor to the leading magazines of this country.

BRANDENBURG, a province of the German Empire, with an area of 15,381 square miles, and a population on December 2, 1895, of 2,821,695, giving a density of 183.5 per square mile. The great majority of the population are Protestants—that is, 2,681,637. The Roman Catholics numbered in 1895, 118,265. The agricultural products include rye, oats, barley, wheat, potatoes, beet-root, and hay. The chief minerals are coal and iron. Among the principal manufactures are tobacco, sugar refining, brewing, distilling, and wine-making.

BRANDES, GEORGE MORRIS COHN, Danish author, born in Copenhagen, February 4, 1842; was educated at the University of Copenhagen, and obtained a degree. He has lived in France, Italy, Germany, Poland, Russia, and Scandinavia, and has published many important works on æsthetics, philosophy, literature, and studies of eminent men of letters. His *Shakespeare* was translated into English by William Archer in 1898, and was received with great favor. His chief work in 1899 was a volume of *Poems*. His principal books are: *Danish Poets*; *A Study of Ibsen*; *Lord Braconsfield*; *Holberg*; *Søren Vierkegaard*; *Impressions of Russia*, and *Impressions of Poland*.

BRAULT, P. M., French general, who succeeded General Renouard as chief of the general staff November 4, 1898; died September 22, 1899. He was born January 10, 1837, in Louvigné-du-Désert, Mayenne; was educated at the military school of St. Cyr, and became a lieutenant in 1857. He served with distinction in Algeria and Mexico, winning some distinction in the latter country at the battle of Medallino. As a captain he won for himself in 1870 the cross of the Legion of Honor for his services in the battle of Wörth. In 1873 he became *chef de bataillon*, and for a time was in Algiers, and participated in the campaign in Tunis. He was promoted to the rank of colonel in 1883, and in 1888 he became a general of brigade and chief of the military cabinet of M. de Freycinet, the minister of war. After the fall of the Freycinet cabinet, Brault was made commander of the eleventh division at Nancy in 1892, and in 1896 became commander of the eleventh army corps at Nantes. In October, 1898, M. de Freycinet again became minister of war, and on the 4th of the following month Brault succeeded General Renouard as chief of the general staff. It is said that M. de Freycinet, who, though a civilian, has twice been minister of war, in large measure owed to Brault his military knowledge.

BRAZIL, a republic of South America, on the Atlantic coast, is bounded on the north, west, and south by every other country of the continent except Ecuador and Chile. The capital is Rio de Janeiro.

Area and Population.—Brazil, the largest country of South America, comprising twenty states and a federal district, has an estimated area of about 3,209,000 square miles, and a population, according to the census of 1890 (recently published), of 14,333,915, but which has since been estimated as high as 17,500,000. The most densely inhabited states are: Sergipe, about 42 inhabitants to a square mile in 1890; Rio de Janeiro, 32.9; Alagoas, 22.1; Pernambuco, 20.7; Ceará, 20; Parahyba, 15.7; and Minas Geraes, 14.3. The most sparsely inhabited state is Matto Grosso, where there is an average of only about one person for each five square miles. Rio de Janeiro, the largest city, was reported to have in 1892, 522,031 inhabitants; the other large cities are Bahia, Pernambuco, Sao Paulo, Pará, Porto Alegre, Ouro Preto, Ceará, Pelotas, and Maranhao. Negroes are numerous in the eastern states, numbering about 2,000,000; the Indians, who number about 400,000, are most numerous in the northern states; and the white population is said to be about equalled by the Mestizos, etc. The population of the seaports is chiefly white. Immigration is encouraged; Chinese and Japanese immigrants are admitted; the total number of immigrants in 1896 was 157,948, of whom over 96,000 were Italians and over 24,000 Portuguese. Brazil is the only Portuguese-speaking country in South America.

Government.—The constitution, dating from February, 1891, vests the chief executive authority in a president, who is elected by popular vote for a term of four years, and is assisted by a cabinet of six members, not responsible to the congress, nominated by him, holding office during his pleasure, and presiding over the following departments: the interior, justice, and public instruction; foreign affairs; finance; war; marine; industry, communications, and public works. The president is not eligible for the ensuing term. He is commander-in-chief of the naval and military forces. The vice-president is elected in the same manner as the president. The chief executive, who was inaugurated November 15, 1898, is Senhor M. F. de Campos Salles; the vice-president is Senhor Rosas e Silva. The legislative power devolves upon a congress of two houses, the senate and the chamber of deputies,

the regular sessions of which begin each year on the 3d of May and continue four months. Each state and the federal district are represented by three senators, who are elected by popular vote for terms of nine years, one-third of the whole number of senators being chosen every third year. There are 212 deputies, elected by popular vote for terms of three years, in the proportion of one for each 70,000 of the population; but no state may have less than four deputies. The states having the largest representation are: Minas Geraes, 37; Bahia and Sao Paulo, each 22; Pernambuco and Rio de Janeiro, each 17; and Rio Grande do Sul, 16. Those having the minimum number four are Amazonas, Espirito Santo, Goyaz, Matto Grosso, Paraná, Piahy, Rio Grande do Norte, Santa Catharina, and Sergipe. The states, which were formerly the provinces of the empire, maintain their own executive, legislative, and judicial authorities. Import duties, values of postage and other stamp, and bank-note circulation are determined by the federal government; export duties may be fixed by each state. In the states executive and legislative officials are elective, and, except in the case of some city justices, the judiciary is appointive. The administrative authority in the federal district rests with a prefect, appointed by the president of the republic, and a council elected by the citizens of the district. Besides courts of first and second instance, there is at the capital of each state an appellate court and at Rio de Janeiro a supreme tribunal.

Army and Navy.—There is compulsory military service of three years in the active and three in the reserve army. The active army, comprising infantry, cavalry, and artillery, numbered in 1897 about 4000 officers and 24,160 privates. It was reported in 1899 that the national militia was undergoing reorganization. There is a police force of 20,000 men. The composition of the navy is reported as follows: 2 third-class battleships, 2 armorclads, 1 first-class cruiser, 3 second-class cruisers, 2 third-class cruisers, 3 torpedo cruisers, 8 first-class torpedo boats, 6 second-class torpedo boats, 5 river monitors, 1 coast-defence vessel, a number of small cruisers and gunboats and small vedette craft. Some of the more important vessels are: the third class battleships, *Riachuelo*, 5700 tons displacement, and *24 de Maio*, 4950 tons, both built in England, and completed in 1884 and 1885 respectively; the second-class cruiser *Almirante Tamandare*, 4465 tons and 7500 nominal horse-power, built in Brazil in 1890; the second-class cruiser *Barroso*, 3600 tons, nominal speed 20 knots, launched at Elswick in 1896; the third-class cruiser *Benjamin Constant*, 2750 tons; the armorclads *Marshal Floriano* and *Marshal Deodoro*, recently built at La Seyne; the torpedo cruisers *Tupy*, *Timbira*, and *Tamoyo*, each 1030 tons, recently launched at Kiel. The naval complement numbers about 8900. There are naval arsenals at Rio de Janeiro, Pernambuco, Bahia, Pará, and Ladario de Matto Grosso.

Finance.—The chief items of revenue are import duties, returns from the railways, posts, and telegraphs, and the sale of stamps; the largest expenditures are for the departments of finance, industry, war, marine, and the interior and justice. The ordinary revenue and the expenditure in 1897 were 293,223,000 milreis and 328,974,000 milreis respectively; for 1898 the ordinary revenue was 325,197,123 milreis, and the expenditure 372,812,424 milreis. The budget submitted for 1899 in milreis was: Revenue, 346,164,000, of which 222,000,000 were accredited to import duties; expenditure, 346,000,423, of which 165,924,210 were for the department of finance. The value of customs receipts in milreis has been as follows:

	Import Duties.	Total Customs Receipts.
1897.....	223,442,679	244,486,193
1898.....	219,823,945	245,909,405

At the close of the year 1897 the total public debt, exclusive of the "Western Minas Loan," amounting to \$17,546,796, was 2,000,277,691 milreis. This debt consisted of the following items, expressed in milreis: Foreign debt, 308,420,444; internal debt, 637,425,600; circulating paper, 439,614,276; bank-notes, 315,344,330; floating debt, 299,473,041. Two additional loans were made to meet the deficits existing at the close of 1897, one of 60,000,000 milreis and the other of 17,824,176 milreis (£2,000,000). It was reported in the early part of 1899 that President Salles had in a considerable degree strengthened the financial relations of the country, and that Brazil's creditors had agreed to the issuing of funding bonds amounting to \$10,000,000. Nevertheless, financial conditions during the year were not good. This, of course, was due in part to the depreciation of coffee. The congress adjourned on November 22, 1899, without having effected, it was said, any measures for the improvement of the financial and commercial situation.

The reported budgets for 1897 of all the states except Sergipe, Parahyba, and Sao Paulo, have a total revenue of 102,286,000 milreis, and a total expenditure of

101,977,000 milreis; twelve of the budgets showed a surplus, three a deficit, and two balanced. In 1895 the aggregate state debts amounted to 91,706,736 milreis.

The circulating currency is chiefly inconvertible paper; this amounted at the end of 1897 to 712,355,394 milreis, an increase of about 28,653,000 milreis over the circulation of the previous year. Measures were instituted in 1897 for reducing the circulation by withdrawing notes, the rate of withdrawal for that year being 10 per cent.; for 1898, 15 per cent., and for 1899, 20 per cent. The nominal monetary standard of Brazil is gold. The value of the milreis in United States currency is \$0.546.

Industries, Commerce, Etc.—Agriculture is the principal industry and coffee the most important crop. Other prominent products are sugar, tobacco, cotton, Paraguay tea, rubber, cacao, nuts, and timber. The coffee yield, which until recently has been constantly increasing, was estimated to exceed 11,000,000 bags in the year 1897-98, and to be between 8,000,000 and 9,000,000 bags in the year 1898-99. (See the article COFFEE.) Sugar culture is especially important in the state of Pernambuco, and cattle-raising in Rio Grande do Sul; in the latter state also coal is mined, and gold-mining is carried on in Minas Geraes, and less extensively in Bahia, where other metals, including silver, zinc, iron, manganese, copper, and mercury, are found. Iron deposits are particularly rich, but scarcity of proper fuel for smelting prevents any considerable exploitation. In the coast districts there are a number of flourishing manufacturing interests, cotton mills especially being on the increase.

Brazilian commerce is carried on chiefly with Great Britain, the United States, and France. The principal imports include cotton and woollen goods, iron ware, and machinery, flour, coal, cattle, jerked beef and other provisions, timber, and alcoholic liquors. The values in milreis of the leading exports in 1897 were: Coffee, 509,190,115; rubber, 149,691,325; tobacco, 23,941,821; hides, 13,427,229; cacao, 12,757,957. The annual rubber export of the Amazon basin is enormous, notwithstanding the sparse population of this region. The Brazilian export of this article was reported at 25,036,628 pounds in 1897, 22,200,332 pounds in 1898, and 18,227,500 pounds up to September, 1899.

In 1898 the merchant marine comprised 229 steamers and 344 sailing vessels of 94,262 tons net and 88,000 tons net respectively. The coasting trade in 1897 was carried on by 212 steamers and 388 sailing vessels of 70,680 tons and 26,637 tons respectively. The foreign shipping entered at the principal ports in 1897 was: 1274 vessels, 2,146,834 tons; Pernambuco, 948 vessels, 1,145,706 tons; Rio Grande do Sul, 474 vessels, 249,145 tons; Paranagua, 429 vessels, 227,713 tons; Ceará, 285 vessels, 258,368 tons; Rio Grande do Norte, 241 vessels, 51,763 tons; Parahyba, 194 vessels, 185,488 tons; Maranhao, 189 vessels, 260,443 tons. The coffee-shipping cities in the order of their importance as such are Santos, Rio de Janeiro, Victoria, Bahia, Ceará.

Communications.—Vast areas of the interior of Brazil are not only unsettled, but are practically unexplored; even where in those regions small settlements have been made regular roads are almost non-existent. In the less sparsely inhabited districts, however, railways have been constructed to a considerable extent, Brazil ranking eighth for railway mileage among the countries of the world. In 1899 this mileage was reported at 8722 miles (14,035 kilometres), the greatest mileage of any Latin-American country except Argentina, and many miles of line were in process of construction. Some of the railways are owned by the government and some by private companies; most of the latter lines are guaranteed by the government interest at 6 or 7 per cent. on the capital invested. The telegraph system, which is controlled by the government, and the expenditure of which is between two and three times the revenue, comprised in 1895 10,143 miles of line, and 21,936 miles of wire, with 289 offices.

Religion and Education.—The Roman Catholic is the dominant religion, but though the government grants appropriations for the functionaries of this church, all other faiths receive full toleration. In 1890 there were about 14,179,600 Catholics and 143,700 Protestants in the country. In the Roman Catholic system Brazil comprises an ecclesiastical province.

Education is in a very backward condition, 84 per cent. of the population, it is reported, being illiterate. Even approximately accurate data on public instruction in the states are unobtainable even by the federal government, but in 1889 it was officially stated that the public and private primary schools numbered about 7500, with an attendance of about 300,000 pupils. Educational facilities in the various states present great dissimilarities, but in general there may be said to be three grades of public instruction—primary, secondary, and higher. The first, which is free, is under the control of state and municipal authorities. Secondary instruction is chiefly private, but some schools are controlled by the states and two by the federal government. Under control of the latter also is the higher instruction, represented by two schools of law, each with 23 instructors, at Sao Paulo and Pernam-

buco; two of medicine and pharmacy, each with 20 instructors, at Rio de Janeiro and Bahia; a school of mines, a polytechnic, four military schools, one naval school, and a lyceum of arts and trades. The last named had in 1890, 2277 students, and the others 2916. Besides these, there were about 575 students attending other special schools. There are 11 seminaries for the private instruction of the clergy; all public instruction, however, is under lay management. Not anywhere in the country is education compulsory.

Cruise of the Wilmington.—In the spring of 1899, after a long voyage into the interior of Venezuela on the Orinoco River, the United States gunboat *Wilmington*, commanded by Captain A. S. Crowninshield, made a similar cruise up the Amazon. The chief object of these trips was to show the United States flag in ports where it is scarcely ever seen, cultivate friendly relations with the inhabitants, stimulate American trade, and ascertain new facts concerning these little-known regions. By April 4 the *Wilmington* had reached Manaos, a young and prosperous city of about 20,000 inhabitants, 1000 miles from the mouth of the Amazon. The vessel then proceeded about 1500 miles farther, going up the Solimoens to Iquitos, Peru.

Revolt in Amazonas.—In the summer of 1899 an attempted revolution occurred against the Brazilian government in upper Amazonas. The inhabitants of this district attempted to set up an independent state, with a republican form of government, but the movement amounted to little, and by the last of August was no longer considered serious. It was condemned by the congress of the state of Amazonas as "misguided."

The Guiana Boundary.—For some time there has been a dispute between Brazil and France concerning the Guiana boundary line. The trouble, however, did not arise until after the discovery of gold in 1894 in what is now the disputed territory. On the 15th of August, 1897, the two governments signed a treaty submitting the question to arbitration, and on December 6, 1899, chose the Swiss government as arbitrator. The contention of Brazil is for the possession of a district that has been considered a part of Guiana. The documents are voluminous, the statement of Brazil comprising four volumes and an atlas, and the reply of France one volume and three maps. On February 21, 1899, a conflict occurred between the escorts of the commissioners sent out by France and Brazil to explore the boundary region.

BREMA, MARIE, opera-singer, born in Liverpool, England, about 1855. She first appeared at the Monday Popular Concerts, in London, in 1890, and sang the title rôle of Glück's *Orpo*, and Lola in *Cavalleria Rusticana* in 1891 in London. Her voice is a mezzo-soprano of much volume, and she has devoted herself to Wagnerian rôles. She has sung Ortrud, Fricka, and Kundry at Bayreuth. Brema first appeared in the United States as Brangäne with the Damrosch Opera in 1895. She sang in America and London with the Grau Opera in 1899.

BREMEN, a state and free city on the Weser, about fifty miles from its mouth, with a population on December 2, 1897, of 202,465. It is one of the chief ports of Germany, and one of the chief outlets of emigration. In respect to international trade it ranks next to Hamburg, and its trade is with not only European countries, but with the United States, West Indies, Africa, East Indies, China, and Australia. Its commerce has steadily increased since 1894. The value of imports in millions of marks from 1894-97 inclusive was as follows: 1894, 694; 1895, 806; 1896, 821; 1897, 894; and of its exports during the same period 1894, 672; 1895, 766; 1896, 809; 1897, 852. The value of a mark in United States currency is 23.8 cents in gold. The largest share of the imports in 1897 were from the German Empire, but the United States supplied nearly as much. As to the exports, the largest fraction went to the German Empire, and the next largest to the United States. By far the greatest portion of the imports came by sea, while the larger portion of the exports were shipped by land and by river steamers. The merchant marine on January 1, 1898, numbered 473 sea-going vessels, including 242 steamers.

BRICKS. See CLAY.

BRIDGES. Bridge building was active during 1899, but the new work consisted largely of numerous small structures, few new bridges of great size being placed under construction. In this bridge work the tendency of the last few years toward better shop work, riveted connections, solid floors, and generally heavier and more durable construction was continued. During the year American bridge builders increased materially their operations in foreign countries. Several shipments of railway bridges were sent to Russia, Africa, Japan, and the South American countries. The most advertised of these foreign contracts was the bridge built by the Pencoyd Iron Works, of Philadelphia, Penn., for the extension of the military railway into the Soudan by the British War Department. This bridge consisted of seven 147-foot spans, weighing altogether 800 tons, and it was con-

structed ready for shipment in thirty-two days from the date the contract was closed. See EGYPT.

Substantial progress was made on the New East River Bridge at New York City during 1899. At the end of the year preparations were under way for erecting the steel towers which will carry the suspension cables. Specifications were prepared during the year for these cables. As specified, there will be four cables, each $17\frac{1}{2}$ inches in diameter and each composed of 37 parallel strands of 287 wires each, a total of 10,397 wires in each. These wires will be 0.165 inches in diameter, and will be of steel having an ultimate tensile strength of 200,000 pounds per square inch. Each cable when completed will be covered with a removable cylindrical steel plate armor to protect it from the weather. Besides the work on the new East River Bridge two other East River bridges were placed under way during the year. One of these was a suspension bridge, located about a quarter of a mile above the present Brooklyn Bridge, with a centre span of 1447 feet and two shore spans of 970 feet each, and the other was a cantilever bridge crossing the river at Blackwell's Island, with five spans, the longest of which is 1050 feet. The preliminary surveys and location were completed for these bridges, and the sum of \$50,000 each was appropriated for making borings for the foundations. The New York Municipal Assembly on December 30 approved the construction of both bridges, and appropriated \$1,000,000 for beginning work on the suspension structure. During the year the Lewiston and Queenston Suspension Bridge across the Niagara River, which was begun in 1898, was completed and opened for traffic. This bridge has a span of 800 feet between the rocker bents carrying the ends of the stiffening trusses. The width of the roadway between trusses is 28 feet. This bridge was built chiefly for an electric railway line, but it will also carry highway traffic.

In drawbridge construction the bascule bridge over the Fort Point Channel, Boston, and the Charlestown Bridge in the same city are the most notable examples of 1899. The Fort Point Channel Bridge was built to carry the six tracks of the New York, New Haven and Hartford Railroad into the Boston South Terminal Station. The span of this bridge is 83 ft. $8\frac{1}{4}$ in. Another bridge of the same type was planned to cross the Chicago drainage canal at Campbell Avenue, Chicago, Ill. This bridge will carry eight railway tracks and will have an open span of 150 feet. The Charlestown bridge at Boston is a swing span, 240 feet long, which is chiefly notable for its great width of 100 feet.

In masonry bridges the most notable feature of the work of 1899, as of 1898 and the few years previous, was the increasing use of concrete and imbedded metal skeleton arches, and in Europe of masonry arches with hinges of stone or metal. None of the new constructions of this class have been of unusual character.

BRIDGMAN, FREDERICK ARTHUR, American painter, born in Tuskegee, Ala., November 10, 1847. After studying in Brooklyn and New York, he went to Paris and became a pupil of Gérôme. From 1866 till 1871 he studied in the École des Beaux Arts. His studio is in Paris, but he occasionally visits America. An exhibition of his works attracted much attention in New York in 1899. His subjects are chiefly Oriental and archæological. See PAINTING.

BRIGGS, the Rev. CHARLES AUGUSTUS, D.D., LL.D., formerly professor of Hebrew and cognate languages and now occupying the chair of biblical theology in Union Theological Seminary, New York, was born in New York City in 1841. He was pastor of the Presbyterian church at Roselle, N. J., from 1869 to 1874, and has held since 1874 a professorship in the Union Theological Seminary. His inaugural address upon taking the chair of biblical theology in 1891 contained statements respecting the Bible, inspiration, and the place of reason in religion, which were voted heretical by the Presbytery of New York. Later, the General Assembly of the Presbyterian Church formally disapproved his appointment to the seminary, and in 1893 he was suspended from the ministry of the church, but the seminary refused to remove him from its faculty. The controversy thus occasioned in religious circles was revived in 1899 by the application of Dr. Briggs for membership in the Protestant Episcopal Church and later his ordination to the priesthood of that denomination. His admission to the church was vigorously opposed by a number of prominent churchmen, who disapproved of his views on biblical criticism, but he was supported, on the other hand, by Bishop Potter and by other well-known members of the clergy, and was ordained on May 14. Among the published writings of Dr. Briggs are: *The Higher Criticism of the Hexateuch*, 1893; *The Messiah of the Gospels*, 1894, and *Biblical Study*, 1895. The first-named work was also published in 1897 in a new and revised form. He wrote, also, *The Bible, the Church, and the Reason: Whither?* In 1899 was published his *General Introduction to the Study of Holy Scripture*.

BRIGHT, the Right Hon. JACOB, who died November 8, 1899, was a privy councillor and a member of the English Parliament for nearly thirty years and a brother

of the statesman, orator, and exponent of free trade, John Bright. His career was similar to that of his brother, and he probably would have been better known as a public man had he not been overshadowed by the fame of John Bright. His best efforts were put forth in the cause of ameliorating the condition of woman and improving her legal status. He gave great attention and support to all efforts for the improvement of woman's position as regards property rights and legal, civil, and political disabilities. Much of the legislation which has placed the legal status of women in Great Britain on a firmer basis was introduced by him, and he was prominent in bringing about the extension to women, in 1869, of the right of municipal voting. His ideas on woman suffrage were radical, and it was his opinion that women should vote for members of Parliament. Mr. Bright was chairman of the firm of John Bright and Brothers, of Rochdale, and a director of the Manchester ship canal. He was one of the founders of the Reform clubs of London and Manchester and a member of the National Liberal Club. He was born in 1821.

BRINTON, DANIEL GARRISON, a celebrated ethnologist and anthropologist and professor of American archæology and linguistics in the University of Pennsylvania, died at Atlantic City, July 31, 1899. He was born in Thorndale, Penn., May 13, 1837. After his graduation at Yale in 1858, he entered the Jefferson Medical College, where he graduated in 1861. He then studied in Paris and Heidelberg, and, returning to the United States, entered the Union volunteer army, in which from 1862 to 1865 he rendered valuable service as assistant surgeon, surgeon, and finally medical director of the Eleventh Army Corps. He was honorably discharged with the rank of brevet lieutenant-colonel. From 1867 to 1887 he was editor of the *Medical and Surgical Reporter*. He became professor of ethnology at the Philadelphia Academy of Natural Sciences, and in 1886 accepted a call to the chair of American archæology and linguistics in the University of Pennsylvania. In 1894 Professor Brinton was president of the American Association for the Advancement of Science. His work in the field of American-Indian literature is very important. He attained valuable results from his study of primitive religions, collecting facts, by which he traced the evolution of religious beliefs. Not long before his death he gave his books and manuscripts relating to the aboriginal languages of North and South America to the University of Pennsylvania. He edited the *Library of Aboriginal American Literature*. It is stated that in the Boston Public Library there are over eighty works either written or edited by him. Among his works are: *The Myths of the New World*, 1868; *The Religious Sentiment*; *The Iroquois Book of Rites*, 1883; *American Hero-Myths*; *Chronicles of the Mayas*; *The Lenâpé and their Legends*; *Races and Peoples*, 1890; *The American Race*, 1892; *The Pursuit of Happiness*; *Nagualism*; *Primer of Mayan Hieroglyphics*, 1896; *Lectures on the Religions of Primitive Peoples*.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, founded 1831, is composed of the following sections: A, mathematics and physics; B, chemistry; C, geology; D, zoology; E, geography; F, economic science and statistics; G, mechanics; H, anthropology; I, physiology, and K, botany. The 1899 meeting of the association, held in September, at Dover, with Sir Michael Foster in the chair, was attended by some fourteen hundred persons and was visited by delegations from two French scientific societies. Among the more important papers was that read in the geological section by R. Etheridge, F.R.S., showing that the recently discovered coal fields in Kent pointed toward the existence of a series of coal basins between Belgium and England; and in the mechanical section that of Sir William White upon naval architecture. The meeting in 1900 will be in Bradford and in 1901 in Glasgow. Secretary, G. Griffith, M.A., Burlington House, W. London, England. For an account of the anthropological expedition to Torres Strait, presented at the Dover meeting of the British Association, see **PSYCHOLOGY** (paragraph Psychology in Europe). See also **ZOOLOGICAL SOCIETIES**.

BRITISH CENTRAL AFRICA is the name applied to that portion of Rhodesia between the Zambesi on the south and German East Africa and the Congo Free State on the north, Portuguese East Africa on the east, and Angola on the west. This territory, with the exception of the British Central Africa Protectorate, is under the jurisdiction of the South Africa Company, and officially known under the title of Northern Rhodesia. The area is estimated at 251,000 square miles and the population at 650,000. The headquarters of the government, which have hitherto been at Blantyre, have been transferred to the Tanganyika plateau. A large part of the territory is uninhabited and the Europeans are very few in number. The products include wheat, European fruits, and coffee. Gold has been found in the southern portion. The western part is the most populous and the best adapted for cultivation. Rice, wheat, oats, coffee, and rubber are said to thrive in that region. There is communication with British Central Africa by way of Lake

Nyassa, and there is a telegraph line in process of construction along the western shore of Lake Tanganyika.

BRITISH CENTRAL AFRICA PROTECTORATE lies to the east of British Central Africa or Northern Rhodesia, and extends along the western and southern shores of Lake Nyassa in the direction of the Zambesi. It has an area of 42,217 square miles, with a population estimated in 1897 at 844,995 natives and 300 Europeans. Great progress has been made in the cultivation of rice, wheat, and coffee in recent years. Oats and barley are raised in the uplands and there is excellent pasturage for sheep. The exports include ivory and coffee, and the imports cotton goods, machinery, provisions, hardware, and agricultural implements. The steamers on Lake Nyassa afford communication with the outside world. There is a telegraph line through the protectorate to Tanganyika in process of construction which will connect Blantyre, the chief town of the protectorate, with Zomba, Salisbury, and Cape Town. A railway from Buluwayo to the Zambesi was undertaken in 1899. Blantyre has a population of about 6000 natives and 100 Europeans. Zomba is the headquarters of the administration. The exports in 1898-99 amounted to £37,964; the imports, exclusive of specie, to £108,383. There are gunboats and steamers on Lake Nyassa and also on the upper and lower Shiré River. This territory was proclaimed a protectorate in 1891 and is directly administered by the British Foreign Office through a commissioner.

BRITISH COLUMBIA. See COLUMBIA, BRITISH.

BRITISH GUIANA, a colony of Great Britain in South America, comprising the settlements of Berbice, Essequibo, and Demerara, is bounded on the north by the Atlantic Ocean, on the east by Dutch Guiana, on the south by Brazil, and on the west by Brazil and Venezuela. The area, including the Venezuelan claim up to the "Schomburgk" line, is 109,000 square miles. (For the settlement of the Venezuelan-British boundary dispute, see VENEZUELA, paragraph History.) The population in 1898 was estimated to be 286,484, nearly one-half of whom are engaged in agriculture; about one-third of the population are negroes and another third East Indians. The capital is Georgetown, population (1891) 53,176. The government consists of a British governor, a court of policy of seven official and eight elective members, and a combined court, comprising, together with the court of policy, six elective financial representatives. The governor in 1899 was Sir Walter J. Sendall. In 1896-97, 209 schools, having about 28,300 pupils, received government aid amounting to \$101,617. The principal sources of revenue are customs and licenses; the leading expenditures are for administration, church, judiciary, education, and public works. Statistics of finance and trade for fiscal years have been as follows:

	Revenue.	Expenditure.	Imports.	Exports.
1896-97.....	\$2,652,802	\$2,873,937	\$6,528,760	\$9,242,757
1897-98.....	2,459,025	2,737,601	6,242,961	8,690,795
1898-99.....	2,558,859	2,556,533	6,673,291	8,140,881

The public debt in 1897-98 was \$4,617,790; in 1898-99, \$4,748,201.

Sugar is the principal product and export, about seven-eighths of the land under cultivation being given to it. Some of the leading exports for the fiscal year 1897-98 were valued as follows: Sugar, \$4,980,462; rum, \$645,163; balata, \$150,636; rice, \$104,059; in 1898-99: sugar, \$5,065,418; timber, \$1,218,753; rum, \$704,168; molasses, \$58,236. The country has rich gold deposits; the output for the fiscal year 1897 was 126,702 ounces; for 1898, 125,080 ounces, valued when exported at \$2,220,977; for 1899, 112,264 ounces, value \$2,016,699.

The chief imports in order of their values are: Textiles, flour, rice, machinery, manures, fish, coal, hardware. More than one-half of the foreign trade is with Great Britain. The merchant marine in 1898 consisted of 132 vessels (16 steam, 116 sail) of 6303 tons. The total arrivals and clearances at the ports in 1897-98 aggregated 621,198 tons. Unlike the South American republics, British Guiana has good roads, which, with 450 miles of navigable rivers, make transportation fairly easy. There are about 40 miles of railway, about 546 miles of telegraph lines, and 70 post-offices.

BRITISH HONDURAS, or BALIZE, a crown colony of Great Britain on the Caribbean Sea, east of Guatemala and south of Yucatan, has an area of 7562 square miles and an estimated population (1897) of 34,277, of whom about 33,800 are colored. The seat of government is Balize, with about 7000 inhabitants. The colony is administered by a governor, an executive council, and a legislative council. The chief item of revenue is customs duties and of expenditure administration. The revenue and expenditure for 1896 were \$302,686 and \$269,877 respec-

tively; for 1897, \$314,017 and \$322,990 respectively; for 1898, revenue \$274,690, expenditure \$301,413. The government debt in 1898 was \$168,815. The principal exports are mahogany, logwood, sugar, and fruit. In 1896 the exports were valued at \$1,378,601 and the imports at \$1,462,637; in 1897 the exports and imports amounted to \$1,404,387 and \$1,422,097 respectively. Great Britain receives about one-half of the exports and sends about one-third of the imports. The total mahogany export in 1897 was 6,777,382 superficial feet; in 1898, 7,630,252 feet. In the latter year 23,579 tons of logwood were exported. The colonial merchant marine in 1898 comprised 5 steamers of 748 tons and 220 sailing vessels of 4906 tons; arrivals and clearances in 1897 aggregated 194,144 tons and 196,189 tons respectively. The total imports in 1898 amounted to \$1,248,910; domestic exports amounted to \$955,264 and transit exports \$327,329—total, \$1,282,593. Of the trade for 1898 imports valued at \$420,127 came from Great Britain, and exports valued at \$853,193 went to that country. Internal communication at present is effected only by canoe and horseback; but in the summer of 1899 a line of railway to cost about \$75,000 (\$364,950) was proposed. The road if built will run inland from the city of Belize and efforts will be made to build an extension to a place at or near La Libertad or Flores in the Guatemalan province of Peten. Besides subsidiary silver amounting to about \$200,000, there are in circulation nearly \$120,000 in government notes. The monetary standard of value since October, 1894, has been the United States gold dollar.

BRITISH MUSEUM, founded in 1753 and first opened to the public in 1759, is now open to visitors every week-day and on Sunday afternoons; occupies buildings in Bloomsbury, London. The manuscript department contains more than 55,000 volumes and ancient papyri, seals, and charters. In the printed book department are about 2,000,000 volumes. A copy of every copyrighted book published in the United Kingdom is deposited there. It is expected that the new catalogue in 600 parts, which is to replace the old catalogue of 3000 manuscript volumes, will be completed in 1900. There are, besides the departments already mentioned, the oriental printed books and manuscripts department, the antiquities department, containing Greek and Roman, Egyptian, Assyrian, British, and mediæval antiquities, and a department for prints and drawings. The annual number of visitors to the museum, according to the latest report, was 612,275, and those to the reading room numbered 190,886.

BRITISH NORTH BORNEO. See BORNEO.

BROOKLYN INSTITUTE OF ARTS AND SCIENCES, organized in 1824, had in 1899 a membership of 5824, but the 26 different departments show for the academic year 1898-99 a membership of 10,061. There is a library of 2700 volumes. During 1899, 9 courses of general lectures were given, besides 572 lectures in the regular departments, and 11 exhibitions were given. The Institute has the museum building partly built, a building in Bedford Park, the art building on Montague Street, a biological laboratory at Cold Spring, L. I., and the Westhampton summer school of art. The year's income was \$119,965. A school of pedagogy was established with 5 classes and an enrolment of 522 students, and a gift of \$10,000 was received for the purchase of an entomological collection. The total attendance at lectures, concerts, and other exercises was 360,980. President of Board of Trustees, A. Augustus Healy; secretary, George C. Brackett, Brooklyn.

BROWN UNIVERSITY, at Providence, R. I., was chartered in 1764. The most important event in its year's history was the selection and inauguration of its new president, the Rev. William H. P. Faunce, A.M., D.D., for the past eight years pastor of the Fifth Avenue Baptist Church, New York City. While the number of students was larger than ever before, the teaching force was somewhat less than during the preceding year. The movement to increase the endowment fund of the university by the sum of \$2,000,000 was carried forward with encouraging results, John D. Rockefeller having given \$250,000 toward it. Among the most noteworthy gifts of the year was a fund of \$10,000 for books on mediæval and church history, given by Mrs. Alice M. Sullivan, daughter of the late Joseph Banigan. Gifts to the library amounted to 2270 volumes; total additions, 4189 volumes. In the women's college there were 165 students and classes were conducted in 28 subjects. Wilfred H. Munro resigned his office as director of the university extension, being convinced after eight years' experience that the scheme was impracticable. On February 9 a fire did great damage to Maxcy Hall, and three days later another fire occurred in Lyon Hall. For statistics see UNIVERSITIES AND COLLEGES. See also PSYCHOLOGY, EXPERIMENTAL.

BRUCE, Rev. ALEXANDER BALMAIN, D.D., professor of apologetics and New Testament exegesis in Free Church College, Glasgow, died August 7, 1899. He

was born in Perthshire January 30, 1831; was educated at the University of Edinburgh, and from 1859 to 1875 was a minister of the Free Church of Scotland. In the latter year he was the Cunningham lecturer in connection with the Free Church, and was called to his professorship in Glasgow. In 1886 he was the Ely lecturer at Union Theological Seminary, New York, and in 1896-98 was the Gifford lecturer at the University of Glasgow. Dr. Bruce wrote: *The Training of the Twelve*, 1871; *The Humiliation of Christ*, 1876; *The Chief End of Revelation*, 1881; *The Parabolic Teaching of Christ*, 1882; *The Galilean Gospel*, 1882; *The Miraculous Element in the Gospels*, 1886; *Life of William Denny*, 1888; *The Kingdom of God*, 1889; *Apologetics, or Christianity Defensively Stated*, 1892; *St. Paul's Conception of Christianity*, 1894; *A Critical Commentary on the Synoptical Gospels*, 1896; *With Open Face, or Christ Mirrored in the Gospels*, 1896; *The Providential Order of the World*, 1897.

BRUCE, Lieutenant-General Sir HENRY LE GEY, K.C.B., died April 15, 1899. Born in 1824 and educated at King's School, Canterbury, he entered the Bengal Artillery in 1842. The next year he served at Gwalior, at Sutlej, in 1846, and in the Punjab in 1848; in 1855 he served on the northwest frontier and took part against the Indian mutiny in 1857-58. Bruce was promoted to the rank of lieutenant-general in 1874. He was created a C.B. in 1874 and a K.C.B. in 1897.

BRUMBY, Lieutenant THOMAS MASON, U.S.N., brought into prominence lately as the flag officer and friend of Admiral Dewey, at Manila, died December 17, 1899. Brumby had been recommended for advance by some numbers on the list of lieutenants, and would thereby have reached in less than a year the rank of lieutenant commander. His death was the third of those closely associated with Dewey in the battle of Manila—namely, Captain Gridley, Commander Wood, and Lieutenant Brumby. Brumby was presented with a sword on October 26 by the legislature of Georgia. He graduated from the Naval Academy in 1879; became junior lieutenant in 1887 and lieutenant in 1892. He was stationed at Samoa during the notable hurricane of March, 1889. When the then Commodore Dewey was assigned to the command of the Asiatic squadron he chose Lieutenant Brumby, then at Washington, as his flag officer. Brumby became noted as the man who, on the surrender of Manila, on August 13, 1898, raised the American flag over the city.

BRUNEL. See BORNEO.

BRUNSWICK, DUCHY OF, a northern state of the German Empire, with an area of 1424 English square miles and a population on December 2, 1895, of 434,213, of whom the Roman Catholics numbered 19,508, nearly all the rest belonging to the Lutheran Church. The capital is Brunswick, with a population in 1895 of 115,138. The chief crops are oats, wheat, rye, and beet-root. The mineral products, including salt, are obtained in considerable quantities. At the beginning of 1898 the public debt amounted to 26,977,407 marks (the mark, in United States gold, being between 23 and 24 cents). The budget estimate for 1898-99 was 14,745,000 marks. The constitution dates from 1832, but has undergone two important modifications by the fundamental laws of 1851 and 1888. There is a legislature, consisting of one chamber of 46 members and meeting every two years. The executive authority is vested in the duke (Prince Albrecht in 1899) and in a responsible ministry of state, consisting of three departments—namely, state, foreign affairs, and finance; justice and ecclesiastical affairs, and the interior. In 1899 there was a reform of the electoral law, by which the legislative body should consist of 48 deputies. There were also changes made in the tax laws.

BRYAN, WILLIAM JENNINGS, who was regarded in 1899 as the probable Democratic candidate in the next Presidential election, continued his work of lecturing and speaking in the cause of bimetallism and against trusts and colonial expansion during the year. He was born in Salem, Ill., March 19, 1860, and graduated at the Illinois College (Jacksonville) in 1881 and at the Union College of Law (Chicago) in 1883. After practising in Jacksonville, he removed to Lincoln, Neb. In 1891-95 he served in Congress, and in 1893 was elected United States senator. In 1896 he was a delegate to the National Democratic Convention, made a notable speech, and received his nomination for President. He was editor of the *Omaha World-Herald* in 1894-96, and has subsequently contributed many articles to magazines and newspapers. In May, 1898, he raised the Third Regiment of the Nebraska volunteer infantry and served as its colonel.

BUBERTL, CASPER, one of the most prominent sculptors in America, died at his home in New York August 22, 1899, in about his seventieth year. He was born in Bohemia, studied art in Vienna, and a few years before the Civil War came to the United States. Among some of his well-known works are the bas-reliefs on the

Garfield monument in Cleveland; the figure of Columbia in front of the Congressional Library in Washington; the bronze statue in Alexandria, Va., symbolical of the "lost cause"; the allegorical groups of the patent office, Washington; the Ponce de Leon statue, created for the Venezuelan republic. Just before his death he was engaged upon works designed for the triumphal arch which was erected on Fifth Avenue, at Twenty-fourth Street, New York, in celebration of Admiral Dewey's return and the victories of the Spanish-American war.

BUBONIC PLAGUE. See PLAGUE.

BÜCHNER, FRIEDRICH KARL CHRISTIAN, celebrated German materialistic philosopher, was born in Darmstadt, March 28, 1824, and died there May 1, 1899. He studied in Giessen, Strasburg, Würzburg, and Vienna, and having graduated in medicine, practised his profession for a time in his native city. In 1852 he was appointed a lecturer at Tübingen, which position he was forced to resign on account of the philosophic doctrine set forth in his *Kraft und Stoff*, published in 1855. He thereupon resumed his medical practice in Darmstadt. Among Büchner's subsequent works are the following: *Aus Natur und Wissenschaft*, 1874; *Natur und Geist*, 1876; *Aus dem Geistesleben der Tiere*, 1880; *Licht und Leben*, 1881; *Die Macht der Vererbung*, 1882; *Der Fortschritt in Natur und Geschichte im Licht der Darwinschen Theorie*, 1884; *Liebe und Liebesleben in der Tierwelt*, 1885; *Thatsachen und Theorien aus dem naturwissenschaftlichen Leben der Gegenwart*, 1887; *Das künftige Leben und die Moderne Wissenschaft*, 1899; *Fremdes und Eigenes aus dem geistigen Leben der Gegenwart*, 1890; *Zwei gekrönte Freidenker*, 1890; *Das goldene Zeitalter oder das Leben vor der Geschichte*, 1891; *Das Buch vom langen Leben oder die Lehren von der Dauer und Erhaltung des Leben*, 1892. Büchner's materialistic philosophy has had wide influence. His *Kraft und Stoff* has passed through seventeen German editions and has appeared in numerous editions in thirteen other languages. Philosophically considered, the book is not one of great merit. Its popularity is probably due to the fact that it contains a large amount of scientific knowledge, non-technically phrased, and that with the air of standing for truth and justice, it attacks creeds and the church. In it he promulgated the doctrines of the indestructibility of force and matter—doctrines now generally accepted—and also that nothing beyond physical force is known to man, that neither God nor ends exist in nature, and that man has no soul endowed with immortality and freedom. Later he insisted on the infinity of forms of being and the co-existence of light and life. The difficulty that goes so far to invalidate *Kraft und Stoff* as a work of sound philosophy is the same difficulty that has baffled so many other writers in their attempts to found an *à posteriori* philosophy upon the laws of the physical world. The trouble lies in the conception of mind from the materialistic point of view. Büchner may with fairness be judged by *Kraft und Stoff*, as the last German edition appeared as late as 1892. With regard to the above-mentioned difficulty of this book, Professor Friedrich Paulsen says: "There are three kinds of conceptions concerning the relation of thought and movement, which are tangled into an inextricable snarl: 1. Thought is motion; 2. Thought is the *effect* of motion; 3. Thought is indissolubly *connected* with motion. 'Thought and extension can be regarded only as two aspects of one and the same unitary being' (p. 300), the real nature of which is as yet unknown to us (pp. 3, 316). *Influxus physicus*, Parallelism, Identity, and the popular conceptions, Spinoza, Kant—all these stagger around like drunkards." The work of Büchner, however, has its good results. It has made clearer and more prominent in the popular mind a knowledge of the laws of nature; and through both its truthfulness and its error it has inspired philosophical thought that is setting in the right direction. Büchner was a brother of Georg Büchner, the poet, of Luise Büchner, the novelist, and of Alexander Büchner, the literary historian.

BUCKALEW, CHARLES R., formerly United States Senator from Pennsylvania, died in Bloomsbury, Penn., May 19, 1899. He was born in Columbia County, Penn., December 28, 1821; received an academic education, studied law, and was admitted to practice in 1843. In 1845-47 he was prosecuting attorney of Columbia County. From 1850 to 1858 he served as State senator, and was appointed in 1857 to revise the penal code. The following year he was appointed minister to Ecuador, where he served till 1863. From this year until 1869 he represented Pennsylvania in the federal Senate. In 1869 he was again elected state senator, and in 1872 was the Democratic candidate for governor. He was a member of Congress from 1887 to 1891, representing, as a Democrat, the seventeenth district of his State in the Fifty-first and Fifty-second Congresses. He wrote *Proportional Representation and An Examination of the Constitution of Pennsylvania*.

BUCKWHEAT. The following table, published by the department of agriculture, division of statistics, shows the acreage, production, and value of buckwheat in the United States in 1899:

STATES AND TERRITORIES.	Acreage.	Average yield per acre.	Production.	Average farm price Dec. 1.	Farm value Dec. 1.
	<i>Acres.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Cents.</i>	<i>Dollars.</i>
Maine.....	23,754	22	522,588	44	229,939
New Hampshire.....	2,327	20	56,540	50	28,270
Vermont.....	9,348	22	215,004	52	111,802
Massachusetts.....	2,309	20	44,180	70	30,926
Connecticut.....	3,307	19	72,333	63	45,570
New York.....	241,543	18	3,140,059	59	1,852,635
New Jersey.....	10,422	21	218,862	56	122,563
Pennsylvania.....	242,280	20	4,845,600	54	2,616,624
Delaware.....	273	18	4,914	49	2,406
Maryland.....	7,510	13	97,630	56	54,673
Virginia.....	4,616	14	64,624	54	34,897
North Carolina.....	1,685	17	28,645	49	14,036
Tennessee.....	1,005	12	12,060	57	6,874
West Virginia.....	14,015	17	238,255	56	133,423
Ohio.....	9,415	16	150,640	58	87,371
Michigan.....	23,083	11	253,913	55	139,653
Indiana.....	5,331	16	85,296	59	50,325
Illinois.....	4,732	15	71,430	58	41,429
Wisconsin.....	30,936	15	464,040	63	292,945
Minnesota.....	11,366	17	193,532	52	100,652
Iowa.....	12,096	16	193,568	58	112,269
Missouri.....	2,499	14	34,986	61	21,341
Nebraska.....	5,104	16	81,664	62	50,632
Oregon.....	240	17	4,080	74	3,019
United States.....	670,148	16.6	11,094,473	55.7	6,183,675

BUILDING STONE. The value of the building stone produced in 1898 was as follows:

Granite.....	\$9,324,406
Marble.....	3,629,940
Slate.....	3,723,540
Sandstone.....	4,724,412
Limestone.....	16,039,056
Bluestone.....	1,000,000
Total.....	\$38,441,354

This shows a gain of \$2,000,000 over the value produced in 1897. The increase in the production of granite was chiefly due to the States of Connecticut, New Hampshire, New Jersey, New York, and Vermont. A new discovery of marble has been reported from the headwaters of the Qualala River in California. The nineteenth annual report of the United States Geological Survey contains a most detailed article by T. N. Dale on the slate belt of eastern New York and western Vermont, the work being a chemical, petrographical, and geological study of the slate belt on the border of New York and Vermont, and one of the most elaborate pieces of work ever done in this line. Among the recent works dealing with this subject are a report on the building stones of Wisconsin by E. H. Buckley, and a German work by Herrmann, entitled *Die Steinbruchindustrie und Steinbruchgeologie*. This latter is one of the most valuable works on the subject that has ever appeared. See **MARBLE**.

BULGARIA, a state of the Balkan Peninsula, tributary to the Sultan of Turkey, but since the treaty of Berlin in 1878 possessing autonomy. Including eastern Roumelia, which was incorporated with it in 1885, under the name of South Bulgaria, the area is 37,560 square miles and the population on January 1, 1893, was 3,310,713, of which 2,504,336 were Bulgarians, 569,729 Turks, and the remainder, in the order of their numerical importance, were Roumanians, Greeks, Gypsies, Jews, Tartars, Armenians, Germans, Austrians, Russians, etc. In 1895 the estimated population was 3,376,467. The capital is Sofia, with a population in 1893 of about 47,000. Agriculture is the chief occupation. The soil is fertile and 25½ per cent. consists of arable land and market garden; about 48 per cent. of pasture. The majority of the agricultural classes are small proprietors holding from one to six acres. Wheat is the chief crop, and is largely exported. The other crops include wine, tobacco, and silk. Stock-raising is an important occupation. The state owns the minerals and works the coal mines at Pernik. The manufactures include woollens, cottons, cord, cigars, and cigarettes. The foreign trade is considerable, but is chiefly confined to European countries; that with the United States is small. The leading country in respect to trade with Bulgaria is Great Britain. In 1898 the total imports were

£2,909,210, and the total exports were £2,661,480. The chief exports are cereals, live-stock, attar of roses, woollens, skins, cheese, eggs, timber, cocoons, and tobacco. There has lately been revived interest in railway building, and in 1899 there were 835 miles of railway open for traffic and 130 in process of construction. The telegraph lines in 1899 had a mileage of 3259. In 1899 the public expenditure was estimated at £3,361,421, and the revenue at £3,363,888. The public debt in September, 1899, was £8,281,960. The army numbers about 16,000, although 40,000 are annually liable to be drafted. The constitution dates from 1879, but was amended in May, 1893. The legislative authority is vested in a single chamber called the Sobranje, whose members are elected by universal manhood suffrage in the proportion of one to 20,000 of the population. There is also a Great Sobranje, consisting of representatives, elected on the basis of one to 10,000 of the population, to decide upon questions of superior national importance, such as the acquisition or cession of territory, changes in the constitution, and the succession to the throne. The executive authority is vested in the prince, who is aided by a council of eight ministers, nominated by him and having charge of the ministries of foreign affairs and public worship, interior, public instruction, finance, justice, war, commerce and agriculture, and public works. The reigning prince is Ferdinand, of Saxe-Coburg, who was elected by the National Assembly in 1887, the election being confirmed by the Porte and the great powers in 1896. The national religion is the orthodox Greek, and the church is governed by a synod of bishops. The state pays the clergy of the orthodox faith as well as the other forms of religion practised in the country.

Events of 1899.—Toward the close of January, 1899, a ministerial crisis occurred in Bulgaria, with the result of replacing the Stoilof by the Grekoff cabinet. The important point to foreign nations was the attitude of the new ministry toward Russia. The previous premier had broken with the policy of Stambouloff, and was conciliatory in his attitude toward Russia, opening the way to a complete reconciliation between Prince Ferdinand and the Czar. The probable course which the Grekoff cabinet would adopt was a matter of speculation. He had formerly the reputation of being a Russophobe, but circumstances had changed, and it was said that Prince Ferdinand would not permit an anti-Russian policy to be adopted by his ministers. On the 31st of January occurred the death of Princess Marie Louise of Bulgaria. On May 7, elections to the Sobranje were held, resulting in the return of 104 members of the government party and 53 opposition members. The government party, however, were soon divided, and later in the year M. Grekoff resigned. A new ministry was formed under M. Ivantchoff in October. The state of the public finances led Prince Ferdinand to forego one-half of the civil list for 1900, and there was a general reduction in the salaries of civil, military, and ecclesiastical officers.

BULLER, Sir REDVERS HENRY, general in the British army, succeeded General Sir George Stewart White in the supreme command of the forces in South Africa after the latter was besieged by the Boers at Ladysmith, Natal, early in November, 1899. After arriving in South Africa, General Buller proceeded with a strong force to the relief of General White, assuming command of the relief column on December 7, but on December 15 he suffered a serious reverse in attempting to force the passage of the Tugela River at Chieveley. His reported loss was about 1000 men and eleven guns. Two days later the chief command of the South African forces was given to General Lord Roberts, who soon after sailed from England for the Cape. (See TRANSVAAL, paragraphs on History.) General Buller was born in 1839, and entering the Sixtieth Rifles in 1859, began a career in which he has rendered to England much valuable service. He served in China in 1860, and in 1870 took part in the Red River expedition; participated in the Ashanti war of 1874, the Kaffir war of 1878, and the Zulu war of 1878-79. In 1885-86 he was deputy adjutant-general, and in the following year became under-secretary for Ireland; in 1890 he served as adjutant-general, and in 1891 received his commission as lieutenant-general. In 1898 he was appointed to the command at Aldershot, his last before going to South Africa. Buller had been regarded as one of the most active and most indomitable fighting generals in the British army.

BÜLOW, BERNHARD VON, German foreign secretary and son of the von Bülow who was foreign secretary of Germany under Bismarck in 1873-79, was born in Schleswig-Holstein, May 3, 1849. He entered the German foreign office in 1873, and was successively secretary of the embassy in Rome, St. Petersburg, and Vienna, and held the important post of *chargé d'affaires* at Athens during the Russo-Turkish war. Immediately afterward he was appointed one of the secretaries of the Berlin Congress. After serving in diplomatic capacities in St. Petersburg and Paris, he was appointed minister to Roumania in 1888, and to Italy in 1893. He filled Baron Marschall von Bieberstein's post as foreign secretary in Berlin during his absence in 1897, and succeeded him to that office. On February 11, 1899, he made a notable



LIEUTENANT-GENERAL SIR REDVERS BULLER.

speech in the *Reichstag* on the relations of Germany to the United States, especially with regard to the Philippine question. See GERMANY (paragraphs on History).

BUNCE, JOHN THACKRAY, English journalist, died June 28, 1899. He was born at Faringdon, Berks, April 11, 1828; was educated in Birmingham, and subsequently throughout his life was connected with the press of that city and with various municipal interests. From 1862 to 1898 he was editor of the *Birmingham Daily Post*, and he was connected with this paper until the time of his death. At various periods in his career Mr. Bunce was governor of King Edward's Schools, member of museums' and art schools' and free libraries' committees of the city corporation, trustee of Mason College, and professor of literature in the Royal Birmingham Society of Artists. He was a fellow of the Royal Statistical Society. His publications include: *Cloudland and Shadowland, a Story for Children*, 1865; *Fairy Tales, Their Origin and Meaning*, 1878; *History of the Corporation of Birmingham*, 1885; *Life of Sir Josiah Mason, with the History of Electro-plating and Steel Pen Making*, 1890; *History of the Birmingham Musical Festivals*.

BUNSEN, Professor ROBERT WILHELM, famous German chemist, died at Heidelberg, August 16, 1899. Dr. Bunsen was born at Göttingen, March 31, 1811. He studied there geology, chemistry, and physics, and continued his work in Paris, Berlin, and Vienna. In 1833 he was appointed a lecturer at Göttingen, and three years later was called to the chair of chemistry in the Polytechnic Institute at Cassel. From this place he went in 1838, as a professor, to the University of Marburg, then to Breslau in 1851, and the next year to Heidelberg, as professor of chemistry. Here he remained till the time of his death, though he retired from active service in 1889.

About the time of his professorship at Cassel he chose alkarsin—Cadet's fuming liquid—as the subject of special investigation, and laboriously prosecuted this work for nine years, the result of which was the creation of a new chapter in chemical science. In the course of these experiments an explosion destroyed the sight of one of his eyes. At Marburg Bunsen became interested in the hematite furnaces, and, realizing that a vast amount of heat was wasted, he invented the appliances of the hot blast. There resulted also from this investigation his method of gas analysis. In 1840 at the meeting of the British Association in Glasgow he first publicly announced his discovery of cacodyl and his method of nitrogen determination. In 1844 he studied volcanoes in Italy and in 1847 investigated the warm springs and geysers of Iceland. This work resulted in his theory of volcanoes and his explanation of the phenomena of geysers. The latter especially has been regarded very favorably by scientists. The beginning of his studies of electrolysis and the electric arc was in 1841; in this year he invented the battery cell bearing his name. Many appliances now in the laboratories are the inventions of Bunsen; most prominent of these, perhaps, are his burner and filter-pump. Probably his most important achievement was the discovery and development of spectrum analysis, by which three departments of science have been created—spectroscopy, spectroscopic chemistry, and spectroscopic astronomy. This work was accomplished in collaboration with his friend Kirchhoff. Bunsen was elected in 1883 one of the eight foreign associates of the French Academy of Sciences. His time was largely but cheerfully given to the instruction of his students, his own investigations being carried on in the early morning and at night. Excessive scientific work did not result in the atrophy of his emotional and sympathetic nature, but he always maintained an active interest in the world of men, in travel, in literature, in life. He published: *Enumeratio ac descriptio hygrometrorum*, 1830; *Das Eisenoxydhydrat, ein Gegengift des weissen Arseniks oder der arsenigen Säure*, 1834; *Schreiben an Berzelius über die Reise nach Island*, 1846; *Über eine volumetrische Methode von sehr allgemeiner Anwendbarkeit*, 1854; *Gasometrische Methoden*, 1857; *Chemische Analyse durch Spektralbeobachtungen*, 1861; *Anleitung zur Analyse der Aschen und Mineralwässer*, 1874; *Flammenreaktionen*, 1880.

BUREAU OF AMERICAN ETHNOLOGY. See ANTHROPOLOGY IN AMERICA.

BURMAH, a province of the Indian Empire, stretching from Thibet on the north to China on the east and Siam on the southeast. On the south and west it is bounded by the Indian provinces of Bengal and Assam and by the sea. It is divided into Lower and Upper Burmah, with a combined area of 171,430 square miles and a population, in 1891, of 7,605,560, of whom the great majority are Buddhists. The chief town of Lower Burmah is Rangoon with a population of 180,324, and the chief town of Upper Burmah is Mandalay with a population of 188,815. It has a fertile soil and abounds in mineral deposits, including copper, lead, iron, tin, jade, ruby, amber, marble, coal, and small quantities of gold and silver. The chief exports are rice and teak, and some manufactured goods are sent to the Shan states and China. It is governed as a part of the Indian Empire, being under a lieutenant-governor appointed by the viceroy and aided by a legislative council of nine members. For the year ending March 31, 1897, the revenue was Rx 5,883,624, and the expenditure Rx 4,222,271. Railway construction has been very rapid in recent years. Early in 1898

it was said that 887 miles of railway were open for traffic and that 261 more miles were either in process of construction or contracted for. On July 1, 1899, the first passenger train was run on the Mandalay-Kunlon line. The most important event of the year was the completion of the demarcation of the Chinese frontier in February. The line runs due east from the river Nam-Yang. Much comment was occasioned by an outrage committed by British soldiers at Rangoon. The inactivity shown by the officers in the matter indicated a lax state of military discipline, and in October, 1899, the governor-general in council issued orders censuring the offenders, reprimanding the officers, and announcing that the regiment would be removed to another station.

BUTLER, WILLIAM, D.D., a missionary of the Methodist Episcopal Church, died at Old Orchard, Me., August 18, 1899. He was born in Dublin, Ireland, January 30, 1818; in 1839 he entered the ministry, and came to the United States in 1850. In 1856 he went as a missionary to India, where he remained ten years. Returning to America, he preached in Boston and Chelsea, and then from 1869 to 1872 was secretary of the American and Foreign Christian Union. In 1873 Dr. Butler went to Mexico, and during the six years following labored in that country in the cause of Methodism. The most important work of his life was that accomplished in India, where he made many converts to Methodism. His field was chiefly in the northwest provinces. He was there during the Sepoy rebellion, and it is said was the only missionary who escaped. He published two standard works on missions, the one treating of India, the other of Mexico.

BUTT, CLARA, singer, born in Southwick, Sussex, February 1, 1870. She was educated at the Royal College of Music, London, and made her *début* in 1892 at a student's performance of *Orfeo* at the Lyceum Theatre, London. In 1899 she visited the United States. Her voice is an exceptional contralto.

BUTTERFIELD, CONSUL WILLSHIRE, American historical writer, died at South Omaha, Neb., September 26, 1899. He was born at Mexico, N. Y., July 28, 1824; he received an academic education, and in 1845-46 attended the State Normal School at Albany, N. Y. He taught school, and in 1848 was appointed superintendent of schools in Seneca County, O. In 1849 he went to California. After acting in 1853-54 as secretary of the Ohio and Indiana Railroad, he began the practice of law at Bucyrus, Ohio, where he remained from 1855 to 1875. In the latter year he removed to Madison Wis., and in 1888 to South Omaha, Neb. Besides various biographies and local histories Butterfield wrote: *A System of Punctuation for Schools*; *The History and Biographical Annals of the University of Wisconsin*; *History of Brule's Discoveries and Explorations, 1610-1626*; *History of Wisconsin*; *History of the Discovery of the Northwest by John Nicolet in 1634*; *History of the Girty's*; *An Historical Account of the Expedition Against Sandusky in 1782*. Butterfield edited: *Short Biography of John Leeth*; *The Washington-Crawford Letters*; *The Washington-Irvine Correspondence*; *The Journal of Captain Jonathan Heart*.

CACAO. See ECUADOR (paragraph Industries and Commerce).

CAISSON DISEASE. Thomas Oliver, in the London *Lancet*, No. 3937, 1899, reports a case of caisson disease, that rare affection which was first described scientifically by Pol and Watelle, at Douchy, France, in 1845. Triger, a French engineer, in 1839 first used a caisson in reaching a bed of coal lying underneath the River Loire. He sank an iron tube through the quicksands, excluding the mud and water by forcing air into the tube under great pressure. This engineering method was modified later, and the caisson of to-day is an air-tight, box-shaped structure, of iron or of wood, without top, inverted, and thus sunk to the bottom of a river. It forms the foundation for a pier or other superstructure, and after the latter has been partly erected the interior of the caisson is filled with masonry. While the workmen are excavating the soil at the bottom of the river and sinking the caisson till it touches bed-rock, they work within the caisson, gaining access to its interior by means of an opening in its top. A pump forces air into the caisson under pressure sufficient to drive out the water which would otherwise enter. Workmen occupied in the caisson suffer from going into the compressed air, and also from coming out of it. The latter is the more dangerous transition. Men can work in the caisson for from two to four hours, according to the pressure. An air-lock is attached to the outer surface of the caisson, in which the pressure can be gradually increased or decreased, as parties enter or leave the caisson. The most important examples of building in which the caisson was used for erecting piers have been furnished by this country. The first was the great bridge built by Captain Eads over the Mississippi River at St. Louis, the other the bridge between Brooklyn and New York, built by the Roeblings, father and son.

Most observers agree that decompression causes the symptoms from which the workmen suffer. In "locking in," or entering the caisson, the temperature rises as

high as 90° in some instances. A corresponding fall occurs on emerging. Thus in cold weather men drenched with perspiration, fatigued with hard work, and relaxed by removal of the air pressure, are brought quickly into a greatly lowered temperature. At the St. Louis bridge the men worked at first in shifts of two hours, three times a day. At the last, at a depth of 136 feet below high water, and under a pressure of 65 pounds to the square inch, they could work but forty-five minutes at a time. At the Brooklyn bridge the men worked at first in two shifts a day, of four hours each; later they worked but two hours at a time, at a depth of 78 feet, under a pressure of 36 pounds to the square inch. The symptoms of caisson disease are buzzing and pain in the ears, dizziness, loss of power in the legs, severe pains in arms, legs, and shoulders, bleeding from the nose and lungs, and occasional unconsciousness. There are three theories of the cause of caisson disease: (1) Poisoning by carbonic acid, (2) congestion of the internal organs with subsequent blood stasis, resulting in possible blocking of the blood-vessels by small thrombi, followed in turn by a necrotic process, and (3) increased solution by the blood of the gases met with in compressed air (principally nitrogen and carbonic acid) and the liberation of these gases during decompression. The second theory is apparently the most trustworthy, if one may judge from the results obtained in 1891 by Van Rensselaer, who has made the most scientific study published of a carefully conducted autopsy with microscopical examination. Preventive treatment suggested consists of selecting sound men for work in the caissons, securing removal of carbonic acid from the air in the caissons, and increasing the time spent in "locking out" to one minute for every three pounds of pressure. Morphia, heat, stimulants, strychnia, and ergot are recommended. Returning to compressed air and emerging with exceeding slowness has benefited many.

CALCIUM CARBIDE, from which acetylene gas is made, is produced in an electric furnace by the action of the heat of large electric currents upon a mixture of lime and coke, 97½ pounds of lime and 56½ pounds of carbon being required to produce 100 pounds of carbide. It is a hard, crystalline body, bluish black to reddish brown in color, is opaque, and there are no known solvents for it. It shows no change or signs of fusion under the action of powerful gas flame, but may be softened and even made to melt by electric heat. Upon adding water to calcium carbide, there is an immediate foaming evolution of the hydrocarbon gas, acetylene (see Gas). No statistics of production are available. It is manufactured in quantities for commerce in the United States, England, France, and Germany. In 1898 the price per ton in the United States was from \$70 to \$75.

CALCUTTA, the capital of the province of Bengal and the metropolis of India, lies on the western bank of the river Hoogly, a branch of the Ganges, about 100 miles from the sea by way of the river. In 1891 it had with its suburbs, exclusive of Howrah, a population of 861,764, and a later estimate places the population at 978,370. It is the seat of an important university, which in 1897 was attended by 2899 students. The expansion of its trade in recent years has been remarkable. In the United States Consular Reports for November, 1899, it is estimated that the total value of the imports for the year just closed from foreign countries alone, without counting the coasting trade, was about \$100,000,000, and that of the exports about \$140,000,000. It is further reported that in the year 1897-98 the sea-going steamers which entered the port numbered 1102, with a tonnage of 3,311,415, and the steamers that left the port numbered 1097, with a tonnage of 3,275,685. The tonnage of all vessels entering the port was more than thirteen times as much as it was in 1841-43. The tonnage of the sailing vessels formed but a small proportion of the total, while thirty years ago there were more than three sailing vessels to one steamer entering the port. The most important class of articles imported was cotton fabrics. Sugar, which used to be an important item of export, is now largely imported. As to the exports, jute, raw and manufactured, was the largest item, and next to this came tea. Other important exports were rice, opium, indigo, lac, silk, saltpetre, raw cotton, twists, and yarn. Coal-mining has of late become an important industry. The exports of coal have greatly increased. The city is the commercial distributing point for the larger part of India. In addition to its increasing trade, there are signs that it is becoming an important manufacturing centre.

CALENTURA. See TROPICAL FEVER.

CALIFORNIA, a Pacific coast State of the United States, has a land area of 155,980 square miles. The capital is Sacramento. California was admitted to the Union September 9, 1850.

Mineralogy.—The annual report of the State mining bureau for the calendar year 1898 gives the value of the total mineral production as \$27,280,079, against \$25,142,441 in 1897 and \$24,281,398 in 1896. The value of the total product of forty kinds of minerals in the period of 1887-98 was \$249,731,303. For the first time in the history of the State copper took second place among the mineral productions in 1898. The

principal productions of the year were: Gold, \$15,906,478, a slight increase over the product of the previous year; copper, 21,543,229 pounds, valued at \$2,475,168, a great increase over any previous production; quicksilver, 31,092 flasks, valued at \$1,188,626, a decline from second to fourth place; petroleum, 2,249,088 barrels, valued at \$2,376,420; borax, 8300 tons, worth \$1,153,000; and silver, \$414,055. The total value here reported was derived from thirty-five different minerals. The history of mining operations during 1899 is one of general activity and prosperity, with exceptional developments in copper, many surprises in gold, and much fruitful prospecting for other minerals. There was a remarkable increase in the production of gold in the southern counties, and the large mines in the famous Rand district of Kern County were run day and night at their fullest capacity, giving all the stamp mills more work than they could do. Among new features of the search for gold were the prospecting along the bottom of the Sacramento River, between Redding and Keswick, to ascertain if dredging would pay, and the dredging of the Tuolumne River bed and bottom lands in the expectation that this former golden stream would again yield large riches.

It would be futile to attempt to summarize the multitude of new finds of the precious metals or the results of renewed work on abandoned claims, but there are a number of mineral discoveries credited to 1899 that deserve mention. Prospecting in Riverside County disclosed valuable deposits of asbestos, magnesia, French chalk, manganese quartz, antimony, plumbago, white quartz, feldspar, and lithia. Near Randsbury, in the Black Mountain region, an excellent quality of bituminous coal was found, and it was estimated from examinations that the deposits occupy an area of 1600 acres. Another important find of coal was made in the mountains southwest of Los Banos, in Merced County. In San Diego County a kaolin deposit was discovered in El Cajon Mountain, which at first was considered valuable as pottery clay, but subsequently was found to be far more profitable for the aluminium it contains. Placer mining along Trinity River in Trinity County yielded considerable amounts of platinum and iridium. In Santa Barbara County a strike of semi-liquid asphaltum was made that needs but little refining, and is worth \$30 per ton. Near Frazier Mountain work was begun on extensive borax deposits, lying in dry lakes and ledges. Mica in large veins was discovered in Riverside County, near San Jacinto, in Ventura County, and on Marble Mountain; tin ore on the Klamath River; alum in Shasta County; antimony in Jawbone Cañon, and asbestos in Tulare County. Work was begun on the lepidolite mines near Pala, a New York druggist contracting to take the output for five years.

Development work was begun on the deposit of iron ore in San Emedio Cañon, Kern County, which shows 2,000,000 tons of iron ore, assaying 60 per cent. of metallic ore, with some gold and a little silver. Unusual activity was reported in the known and suspected petroleum fields, especially by prospectors and capitalists from Pennsylvania. Kern and Fresno counties are more than fulfilling their early promise as oil producers, and have each shown up a number of new and profitable fields. Oil in paying quantity was discovered during the year on the islands in Mono Lake, Mono County, and prospecting was begun in Colusa County. See IRRIGATION.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Humboldt, Los Angeles, San Diego, and San Francisco amounted in value to \$36,916,128, a decrease in a year of \$6,582,517; and the exports to \$31,840,533, a decrease of \$9,231,521. The trade of San Francisco alone was, imports, \$35,747,535; exports, \$30,214,904. The trade in gold and silver ore, bullion, and coin was, imports at San Diego and San Francisco, \$32,199,592; exports at San Francisco, \$6,664,691—making the total foreign trade of the year \$107,620,944, a decrease of \$16,931,232.

Banks.—On October 31, 1899, there were 35 national banks in operation and 17 in liquidation. The active capital aggregated \$10,825,000; circulation, \$2,164,817; deposits, \$35,312,068, and reserve, \$12,929,109. The State banks, July 31, 1899, numbered 176, and had capital, \$27,470,121; deposits, \$77,624,687, and resources, \$136,037,239; private banks, 18, with capital, \$852,143; deposits, \$1,438,055, and resources, \$2,576,648; and stock savings banks, 53, with capital, \$7,654,055; depositors, 209,908; deposits, \$145,943,163, and resources, \$161,319,236. The exchanges at the United States clearing houses at San Francisco and Los Angeles in the year ending September 30, 1899, aggregated \$1,001,834,752, an increase of \$116,710,379 in a year.

Railways.—During the calendar year 1898 new railway construction aggregated in length 118.29 miles, and during 1899, 169.35 miles, giving the State a total mileage of 5461.37. The active development of mining properties in 1899 led to the building of many short connecting lines for electrical propulsion.

Education.—At the close of the school year 1897-98 the school population was 347,624; enrolment in public schools, 259,459, and average daily attendance, 185,424. There were 7432 teachers, 3644 buildings used as school-houses, and public school property valued at \$17,349,468. The revenue was \$5,853,650; expenditure, \$6,266,470, of which \$4,671,191 was for teachers' salaries. There were 96 public high schools,

with 478 teachers and 12,620 secondary students; 63 private secondary schools, with 293 teachers and 2238 secondary students and 6735 elementary pupils; 4 public normal schools, with 74 teachers and 1892 students in all departments, and 3 private normal schools, with 8 teachers and 76 students in all departments. Normal training was also given in 4 colleges and 4 public high schools. Twelve colleges and universities for men and for both sexes reported 11 fellowships, 117 scholarships, 661 professors and instructors, 5547 students, 183,688 volumes in the libraries, \$562,700 invested in scientific apparatus, \$5,261,671 in grounds and buildings, and \$6,639,949 in productive funds, and \$881,646 in total income. Two colleges for women—Mills and Notre Dame—together had 57 professors and instructors, 228 students, 12,000 volumes in the libraries, \$488,000 invested in grounds and buildings, and \$107,405 in total income. In 1899 Mrs. Jane L. Stanford executed deeds conveying to the trustees of Leland Stanford University the bulk of all her wealth in stocks and real estate for the improvement and perpetual maintenance of that institution. This gift brought the total endowment of the university up to the great approximate sum of \$45,000,000. Another woman, Mrs. Phœbe A. Hearst, has devoted much of her large fortune to providing the University of California with a new habitation, which, when completed, will have cost several millions. A third educational event of 1899 was the election of Professor Benjamin Ide Wheeler, of Cornell University, to the presidency of the University of California. In 1899 there were 698 periodicals in the State, of which 110 were dailies, 455 weeklies, and 93 monthlies.

Finances.—On September 1, 1899, the total bonded debt was \$2,281,500, of which bonds for \$1,526,500 were held in trust for the State School Fund, and for \$751,000 for the State University Fund. The State School Fund also held \$200,000 of \$600,000 in depot bonds, not included in the general debt statement. The assessed property valuations in 1898 aggregated \$1,132,230,221, an increase in a year of \$42,856,905. The tax rate was \$4.88 per \$1000. All of the State debt bonds known to exist are held in the educational funds, the surplus of \$4000 being in 1857 and 1860 bonds, probably lost or destroyed.

Population.—As estimated by federal officials on June 30, 1899, the population was about 1,555,000.

Legislation.—It was decided to submit the following constitutional amendments to the people of California: To reduce the Supreme Court from seven to five judges; to provide three courts of appeal and define the jurisdiction of such courts; to give the legislature power to control primary elections; to except Stanford University and Lick School, church property and State, county, and district bonds from taxation, and to provide stenographers for the superior courts. The charters of municipalities received a great deal of legislative attention. A bill which legalized prize-fighting contests up to twenty rounds was approved by Governor Gage, March 31, 1899. The desecration of the flag was prohibited. Eight hours were declared to be a day's labor on public works.

Two bills were passed that restrict the liberty of the press in California, and their constitutionality will probably be tested in the courts, inasmuch as the State constitution expressly declares that "every citizen may freely speak, write, and publish his sentiments" on all subjects, and that no law shall be passed to restrain or abridge the liberty of speech or of the press. The Anti-Cartoon act made it unlawful to publish the portrait of any living person, a resident of California, without the written consent of such person, except those holding office or convicted of crime. The Newspaper Signature act made it obligatory, under penalty of a fine, that every article or editorial blackening the memory of the dead, or impeaching the honesty, integrity, virtue, or reputation of the living, or calling attention to their natural or alleged defects, should be signed by the name of the author.

The Deadlock in the Legislature.—The legislature began its biennial session on January 2, and on January 10 began balloting for a United States senator to succeed Stephen M. White (Democrat), whose term of office expired March 4, 1899. There were 11 Republican candidates, of which the leading ones were U. S. Grant, Jr., D. M. Burns, W. H. L. Barnes, and State Senator R. R. Bulla. The Democrats merely cast a complimentary vote for their candidates, there being 86 Republicans and 34 Democrats on joint ballot, of which 61 were requisite for an election. Governor Gage favored Mr. Burns from the beginning and bitterly opposed Mr. Grant. On March 18 the joint session adjourned, after taking 87 ballots, without making an election, and thus ended the most stubborn deadlock of the legislature in the history of California. An exciting incident of the convention occurred on January 15, when Howard Wright, speaker of the Assembly, was charged with securing a loan of \$1650 from Mr. Grant's manager; a committee was appointed the following day to investigate the charges, and on January 27 filed a report showing that his conduct was censurable; a motion to expel him on account of bribery charges was defeated by a vote of 60 to 10, but on January 30 Mr. Wright resigned the speakership, at the same time declaring that he was guilty of no crime,

and that the findings of the committee were not warranted by the evidence. Mr. Alden Anderson was elected to succeed him.

The San Francisco Charter.—The provisions of this charter are regarded as very thorough and advanced, and this new departure and effort at municipal reform contains much that is of interest. The legislative power is lodged in eighteen supervisors, elected at large; the mayor presides and has the power of veto, but such veto may be overridden by fourteen votes. If fifteen per cent. of the voters petition for a particular ordinance to be voted upon, it must be submitted, and if a majority of votes favor it, it becomes a law at once. Every ordinance granting a franchise or leasing or selling any public utility must be submitted to a vote. The city charter is amendable by vote of the people. No street-railroad franchises shall be granted for more than twenty-five years and must be advertised and bid for. No bid shall be received for less than three per cent. of the gross receipts for the first five years. The city retains the right to regulate fares. The mayor is elected for two years and has exceptional powers. He appoints the Board of Public Works and the Board of Education. The powers and duties of these boards are most carefully guarded. Police commissioners are appointed by the mayor. The police force is to be pensioned for old age and disability from a relief fund, and a similar fund cares for firemen. Most stringent civil service rules are in force. It is the purpose of the city to acquire and ultimately own all its public utilities, and the charter points out the steps to be taken to acquire such ownership.

State Officers and National Representatives.—Governor, H. T. Gage; lieutenant-governor, J. H. Neff; secretary of state, C. F. Curry; treasurer, T. Reeves; comptroller, E. P. Colgan; adjutant-general, W. H. Seamans; attorney-general, T. L. Ford; superintendent of education, T. J. Kirk; surveyor-general, M. J. Wright; supreme court chief justice, W. H. Beatty; associate justices, T. B. McFarland, C. H. Garoutte, R. C. Harrison, W. Van Dyke, F. W. Henshaw, Jackson Temple; clerk, G. W. Root. The State legislature consists of 88 Republicans, 32 Democrats, 2 Populists, and 1 Independent. Senators: George C. Perkins (Republican), from Oakland; the other senatorship (Republican) is not yet filled. Representatives: John A. Barham (Republican), from Santa Rosa; Marion De Vries (Democrat), from Stockton; Victor Metcalf (Republican), from Oakland; Julius Kahn (Republican), from San Francisco; Eugene F. Loud (Republican), from San Francisco; Russell J. Waters (Republican), from Los Angeles, and James C. Needham (Republican), from Modesto.

CALIFORNIA, UNIVERSITY OF, at Berkeley, Cal., was founded in 1868, and its roll of students for the year 1898-99 was larger than in any previous year; the degrees given at the end of the year numbered 360. Among the important gifts received during the year was that of a scholarship from Mrs. C. B. Houghton, of Benicia, in memory of her late husband, and to be called by his name. Professor George Davidson began his work in the newly established College of Commerce. University extension courses were given in San Francisco; farmers' institutes were vigorously pushed throughout the year, exciting great interest; nearly 100 meetings were scheduled. Additional courses in summer schools were provided and a further expansion of summer work organized for another year. The interest in athletics was more general than in any former year. The Wilmerding School, under the care of the regents, found a director in Mr. Everett Schwartz, of Waltham, Mass., and the site originally selected for its buildings has been exchanged for a more convenient one very near the Lick School, so that the two schools will be enabled to work in friendly co-operation. The Regents' Committee on Finance reported an estimated deficit of over \$47,000 for 1899-1900, and the president in his annual statement made a strong appeal for endowments. Professor Benjamin Ide Wheeler (*q. v.*) was inaugurated president. Mrs. Phœbe A. Hearst proposed to give \$8,000,000 toward the endowment fund of the university. The competition to secure the best plans for the new university buildings was held under Mrs. Hearst's patronage at an expense to her of \$10,000. (See ARCHITECTURE.) For statistics, see UNIVERSITIES AND COLLEGES.

CALVÉ, EMMA, French opera-singer, born in Decazeville in 1866, studied singing in Paris under M. Laborde and Mme. Marchesi, and made her *début* in Brussels at the Théâtre de la Monnaie in 1882 as Marguerite in Gounod's *Faust*. In 1884 she was engaged by M. Victor Maurel at the Théâtre Italien, Paris, and sang in *Aben Hamet*, by Dubois. She appeared at La Scala, Milan, and, returning to Paris, sang at the Opera Comique. She made her first appearance in London in 1892, and in 1893 came to New York. In 1899 she came to the United States on her third visit. Her greatest part, Carmen, was first sung in 1892. Her favorite rôles are: The Countess and Cherubino in the *Nozze di Figaro*; Carmen; Ophelia, in *Hamlet*; Pamina, in *The Magic Flute*; Santuzza, in *Cavalleria Rusticana*; Leila, in Bizet's *Les Pecheurs des Perles*; and Sapho in Massinet's opera of that title.

CAMBODIA, a province of French Indo-China, with an area of 46,000 square miles, and a population estimated at 1,500,000, composed of a variety of native tribes, together with 250,000 Chinese and Anamites, and 40,000 Malays. The country has been a French protectorate since 1863. It has a fertile soil, and produces rice, betel, tobacco, indigo, sugar-cane, pepper, maize, cinnamon, and coffee. It has formed since 1887 a part of the customs union with Anam and Tonquin, and with these two provinces and Cochin-China it is under the direction of the Superior Council of Indo-China (*q. v.*), though the local administration is in the hands of the native ruler, King Norodom.

CAMEROON, or the **CAMEROONS** region, a German protectorate of West Africa, has a coast-line of about 200 miles on the Bight of Biafra, between the Campo River and the Rio del Rey, and is bounded on the north by the Niger territories, and on the south and east by French Congo. Its area is estimated at 191,130 square miles, and its population at 3,500,000, of whom 324 were Europeans on January 1, 1898. It extends northward as far as the southern shore of Lake Tchad. The native inhabitants are Bantus and Soudan negroes. The chief town is Cameroen, on the coast, and other important trading centres are Buea, Victoria, Bibundi, and Campo. There is an abundant rainfall. Statistics for the year ending in June, 1898, showed that rain fell on 171 days in that period. The heaviest rainfall was in the season from June to October, and the lightest in the months of January and December. The climatic conditions have not been favorable to Europeans, who have suffered greatly from malarial fevers, but of late there has been an improvement in this respect. The soil is rich, and there is a variety of vegetable products, including cacao, coffee, tobacco, cloves, caoutchouc, vanilla, ginger, pepper, ivory, and palm-oil. Gold and iron are said to occur. Plantations of coffee, cacao, and tobacco have been started and are flourishing, but the development of the colony has been checked by the scarcity of labor, which made it necessary to import foreign workmen. It was reported in 1899, however, that the natives are showing more readiness to work on the plantations. The exports for 1897-98 were valued at 3,920,194 marks, the chief items being gums, palm-nuts, palm-oil, and ivory, and the less important articles being ebony, kola, gum-copal, tobacco, coffee, mahogany, and red wood. The imports for the same period were valued at 7,128,153 marks. The budget for 1899-1900 was estimated at 1,713,000 marks. It was organized as a protectorate in 1884, and is under an imperial governor, assisted by a local council. The boundaries toward the British territories were settled by agreements in 1893, and toward the French sphere of influence by agreements in the following year. There is a small military force, consisting chiefly of natives, and it has been actively employed of late in putting down native revolts. In 1898-99 a number of expeditions were made into the outlying parts of the colony for the purpose of opening up those regions.

CAMPBELL-BANNERMAN, Sir HENRY, G.C.B., M.A., LL.D., member of Parliament for the Stirling district of Scotland since 1868, was unanimously elected leader of the Liberal members of the Commons on February 6, 1899, to succeed Sir William Vernon Harcourt, who had resigned in the preceding December. Sir Henry Campbell-Bannerman is the son of the late Sir James Campbell, and was born September 7, 1836. He assumed the additional name Bannerman, in accordance with the will of his maternal uncle, the late Henry Bannerman. He was educated at Glasgow University and Trinity College, Cambridge, and in 1871 became financial secretary to the war office, which position he held until 1874, and resumed in 1880-82. During the next two years he was secretary to the admiralty, and in 1884-85 was chief secretary for Ireland. In 1886 and from 1892 to 1895 he was secretary of state for war. When Sir William Harcourt resigned the leadership of the Liberal party, that party had become comparatively weak and inefficient. It was torn with internal dissensions, which sprung up after it lost the guiding hand of William E. Gladstone. During 1899 Sir Henry Campbell-Bannerman proved himself an able leader, and brought into at least formal harmony the rival sections of the party, which tend to respond to the influence of himself, Sir William Harcourt, and Mr. John Morley, respectively.

CANADA, DOMINION OF, occupies the northern part of North America, with the exception of the crown colony of Newfoundland, to which Labrador belongs, and of Alaska, which belongs to the United States. The known area in 1899 was 3,653,946 square miles, of which 3,048,711 square miles were land surface, and 605,235 square miles water surface. In addition to this gross area there is the district of Franklin, which was organized October 2, 1895, but has not yet been fully surveyed. The density of population for the entire Dominion, as shown by the census returns of 1891, is 1.5 per square mile. Prince Edward Island had 54.5 persons to the square mile; British Columbia, 0.3, and the provisional districts, 0.2. The capital of the Dominion is Ottawa, and the chief cities are Montreal, Toronto, Quebec, Hamilton,

St. John, and Halifax. The provinces are Quebec, Ontario, Nova Scotia, New Brunswick, Prince Edward Island, Manitoba, and British Columbia, and the districts are Keewatin, Assiniboia, Saskatchewan, Alberta, Athabasca, Yukon, Mackenzie, Ungava, and Franklin. The rivers and the Canadian part of the Great Lakes have together an area of 47,400 square miles.

The following statistics for the entire Dominion, as well as those for the separate provinces, are for the fiscal year ending June 30, 1898, as published in 1899, excepting where otherwise specified:

Agriculture.—In 1899 crop returns, more or less complete, were available from Ontario, Manitoba, New Brunswick, Prince Edward Island, and the Northwest Territories, and will be found under those titles. During the year the exports of animal and agricultural products, all domestic, aggregated in value \$75,834,858, of which \$5,054,853 went to the United States. The agricultural products included wheat to the value of \$17,313,916; wheat flour, \$5,425,760; oats, \$3,041,578, and pease, \$1,813,792. The export of live stock comprised 14,349 horses, valued at \$1,497,444; 213,010 cattle, valued at \$8,723,292, and 351,789 sheep, valued at \$1,272,077. Meats of all kinds, of domestic production, were exported to the gross value of \$8,737,484; eggs, \$1,255,304; butter, \$2,046,686, and cheese, \$17,572,763. The total imports of live stock, dressed meats, and general agricultural products, entered for home consumption, had a value of \$17,942,534, of which \$14,287,685 went from the United States. Exports of raw wool amounted to 1,014,420 pounds, valued at \$177,154. In October, 1899, it was officially estimated that the Dominion would have nearly double the exportable quantity of wheat that was available the preceding year; and that Manitoba would supply more than half of this increase. The quantity exported in 1898 was: Wheat, 18,963,107 bushels; wheat flour, 1,249,438 barrels. Of all cheese in the British market Canada supplies 65 per cent. There are nearly 3000 cheese factories in operation, and the Dominion and provincial governments are promoting the industry with liberal appropriations.

Mineral Products.—In the calendar year 1898 the mineral products had an aggregate value of \$37,757,197, an increase in a year of more than \$9,000,000. The most valuable ones were gold (partly estimated), \$13,700,000; coal, \$8,227,958; silver, \$2,583,298; copper, \$2,159,556; nickel, \$1,820,838; lead, \$1,206,399; petroleum, \$681,106; asbestos, \$486,227; cement, \$397,580; natural gas, \$320,000; salt, \$248,639; gypsum, \$230,440, and coke, \$219,200. Exports of the principal products amounted in value to \$15,210,947. Nova Scotia produced the largest amount of coal, 2,563,180 tons (2000 pounds), and of iron ore, 34,776 tons. The output of gold in the Yukon district was estimated at \$10,000,000, and in the Saskatchewan district at \$25,000. In British Columbia it was \$2,939,852; Nova Scotia, \$538,590; Ontario, \$265,889, and Quebec, \$6089. The famous Sudbury nickel mines yielded more than 5,500,000 pounds in matte, and the exports of the mineral, principally to the United States, amounted to 14,760,996 pounds, valued at \$970,531. In November, 1899, an order in council was adopted by the Ontario government authorizing the renewal of an offer to the British government of an interest in the unpatented portion of the nickel lands of the province, and providing also that the Ontario government may reserve to itself the right to prohibit the export of nickel ore and matte, and that hereafter the conditions under which all grants of nickel lands shall be issued shall be that the ores of such lands be refined in the province. See also ONTARIO.

Fisheries.—The last official statistics of the fisheries industry are for the calendar year 1897. The value of the yield of all kinds was as follows: Nova Scotia, \$8,090,346; British Columbia, \$6,138,865; New Brunswick, \$3,934,135; Quebec, \$1,737,011; Ontario, \$1,289,822; Prince Edward Island, \$954,949, and Manitoba and the Northwest Territories, \$638,416; total, \$22,783,546, an increase in a year of \$2,376,122. There was a total of 78,959 men employed on vessels and other boats engaged in all fisheries, and a capital investment in vessels, nets, and all other apparatus of \$9,370,794. The government expended \$432,635 in promoting the industry, of which \$157,504 was for bounties. Chief values in the total catch were: Salmon, \$5,670,075; cod, \$3,901,539; lobsters, \$3,485,266; herring, \$2,099,077; haddock, \$882,483; whitefish, \$651,429; mackerel, \$597,306; trout, \$534,873, and pickerel, \$316,596. The sealing industry employed 42 vessels, 149 boats, 288 canoes, 495 white men in crews, and 587 Indians, and had a catch of 30,410 seals, whose skins were valued at \$304,100.

Commerce.—The imports of merchandise, in the fiscal year ending June 30, 1898, aggregated in value \$140,323,053; exports, \$164,152,683; excess of exports, \$23,829,630; duties collected on imports, \$22,157,788. The movement in gold and silver coin and bullion was, imports, \$4,390,844; exports, \$4,623,138. The total trade of the year showed an increase of \$47,306,874 over that of the previous year. Of the total imports, \$86,900,702 was from the United States, and \$32,866,007 from Great Britain, and of the total exports, \$104,998,857 went to Great Britain, and \$45,702,678 to the United States. The aggregate trade with the United States showed an increase in the year of about \$12,500,000, and with Great Britain an increase of \$31,226,000.

Official returns for the fiscal year ending June 30, 1899, showed an increase of \$17,185,677 in the total trade over that of the previous year. The gain was attributed to an increase in imports of \$22,441,255. Total exports showed a decline of \$5,345,178, and the exports of domestic productions a decrease of \$7,245,241. Duties collected on imports amounted to \$25,734,229, an increase in the year of \$3,576,441. The merchant marine of the Dominion, on January 1, 1899, comprised 1909 steamers, of 267,237 gross tonnage, and 4734 sailing vessels, of 426,545 gross tonnage. Of the total vessels, 278, of 24,522 tons, were built and registered in the previous year. The revenue of the department of marine was \$120,602; expenditure, \$845,617. For the protection of shipping there were, on the coasts, lakes, and rivers, 654 light stations, 816 lighthouses, 22 fog-whistles, and 40 automatic fog-horns, and \$451,156 was expended for maintenance.

Banks.—The official bank statement for June 30, 1898, showed aggregate paid-up capital, \$62,303,137; notes in circulation, \$36,539,103; deposits of all kinds, \$240,370,873; total liabilities, \$277,407,521; and total assets, \$365,634,052. Discounts given by the banks amounted to \$245,670,654, and the average monthly reserve of the banks through the year was \$27,627,520. Exchanges at the clearing-houses in Montreal, Halifax, Toronto, Hamilton, Winnipeg, and St. John, aggregated \$1,390,019,344, an increase in a year of \$215,308,999. There were in all 641 bank branches in operation. The government savings banks numbered 25, and had 46,093 depositors and \$15,630,181 in deposits; and the post-office savings banks, 814, with 142,289 depositors and \$34,480,938 in deposits—total savings banks, 839; depositors, 188,382; deposits, \$50,111,119. There were 95 loan companies and building societies, which reported paid-up capital, \$44,615,756; reserve, \$10,317,455; deposits, \$18,986,154; total loans, \$116,143,533; liabilities, \$144,870,248, and assets, \$145,378,910.

Insurance.—At the close of 1898 there were 34 fire insurance companies in operation, which together received for premiums \$7,349,669, and paid for losses \$4,784,287; 5 inland marine insurance companies, 2 ocean marine insurance companies, and 26 miscellaneous insurance companies. There was a total of \$368,545,985 life insurance in force, of which \$226,231,636 was carried by Canadian companies, \$36,606,195 by British, and \$105,708,154 by United States. The income from premiums of all life companies was \$12,002,174.

Railways and Canals.—On June 30, 1898, there were 16,870 miles of track laid and 16,717 miles in operation, besides 28 miles of track in Nova Scotia belonging to private corporations. The separate railways number 166, of which 25 constitute the Grand Trunk system; 23 the Canadian Pacific system, and the remainder are more or less consolidated in minor systems. The Canadian Pacific system has 6,300.71 miles of track laid; the Grand Trunk, 3,161.98, and the Intercolonial and Prince Edward Island, 1,355.46. The ordinary share capital of all railways was \$266,669,857; preference capital, \$111,481,933; bonded debt, \$354,946,866. Grants by the Dominion government aggregated \$151,509,812; by provincial governments, \$31,495,545; and by municipalities, \$15,660,668. The earnings of all roads in 1898 amounted to \$59,715,105, and the operating expenses to \$39,137,549. Up to June 30, 1898, there had been expended on canal works and maintenance a total of \$87,571,498, of which \$15,067,096 was appropriated from income. The most costly canal, the Welland, had cost for construction up to that date \$24,208,155, of which \$16,569,915 was expended since confederation. The total revenue from all the canals since confederation was \$11,710,240, an annual average of \$377,750. The closing months of 1899 marked two important events in the history of Canadian canals: first, the completion of the work of deepening what are known as the St. Lawrence canals, thereby providing a channel fourteen feet in depth from Lake Ontario to Montreal, in place of the former nine-foot channel; and second, the completion and opening of the Soulanges Canal, a waterway 14 miles long, on the north side of the river, which, with one guard and four lift-locks, overcomes a total rise of 82½ feet. The new canal replaces the shallow Beauharnois Canal, and is operated and lighted by electricity. It had cost for construction, on June 30, 1898, \$3,655,436, and when opened, in November, 1899, it represented an outlay of more than \$5,000,000. During the navigation season of 1897 the traffic through all Canadian canals was represented by 23,375 Canadian vessels of 4,046,283 tonnage and 7024 United States vessels of 4,702,339 tonnage, and the tolls amounted to \$327,218.

Post-offices and Telegraphs.—On January 1, 1899, the Canadian and United States authorities agreed that there should be a uniform rate of two cents between the two countries, and an assimilation of post-office action in all respects, interchange of stamps, readdress of letters, etc., and on June 1, following, the proclamation, establishing the postage rate within Canada at two cents per ounce, went into effect. Post-offices in the Dominion and Newfoundland, June 30, 1898, numbered 9282, and in the year then ended they handled 134,975,000 letters, 28,150,000 postal cards, and 108,492,655 pieces of periodicals and parcels. The revenue of the department was \$4,686,650; expenditure, \$4,734,252; deficit, \$47,602. Of 3,534,500 registered letters estimated to

have been handled in the year, only 113 containing money failed to reach their destination. The money-order system had 1739 offices, at which 1,164,857 orders were issued. The orders issued and payable in Canada amounted to \$12,082,658; orders issued in Canada and payable elsewhere, \$2,435,822; and orders issued elsewhere and payable in Canada, \$2,162,971. The Dominion government owned and operated 2751½ miles of land telegraph lines and 239 (statute) miles of cables, with 164 offices, and had revenue, \$10,751, and expenditure, \$56,733. The Great Northwestern Telegraph Company, the Canadian Pacific Railway Company, and the Western Union Telegraph Company, which operated all non-government lines, had together 29,548 miles of line, 76,013 miles of wire, and 2591 offices, and handled in the year 4,407,265 messages. Telephone companies numbered 62, with 1369 offices, 43,547 sets of instruments, and more than 70,000 miles of wire.

Education.—Reports of the public, high, normal, and model schools, principally for 1898, give the following summary: Number of public schools, 17,558, other schools, 936; pupils in public schools, 947,208, in other schools, 133,031; average attendance in public schools, 568,337; teachers in public schools, 22,080, in other schools, 4393; revenue from government, \$3,075,407, from other sources, \$6,260,025; and expenditure, \$8,527,410. The higher institutions comprise 17 universities, with 5955 students; 19 colleges, with 2221 students; 19 classical colleges in Quebec, mostly affiliated with Laval University, with 5474 students; 7 colleges for women, with about 1000 students; and 5 agricultural colleges, with 267 students. For further details, see titles of the several provinces. At the end of 1899 there were 875 periodicals, of which 107 were dailies, 606 weeklies, and 101 monthlies.

Finances.—The revenue of the consolidated fund, in the year ending June 30, 1898, was \$40,555,238; expenditure, \$38,832,526, giving an excess of revenue, for the first time since 1893, of \$1,722,712. The customs revenue was \$22,157,788; internal revenue, \$7,884,001; postal service, \$4,686,650; miscellaneous revenue, \$7,450,973—total receipts, \$42,179,412, an increase in a year of \$2,841,411. The expenditures aggregated \$39,991,366, the largest being, on account of the public debt, \$13,076,614; post-office, \$4,734,252; appropriations for railways and canals, \$4,239,765; and subsidies to provinces, \$4,237,372. Civil government cost \$1,399,422; militia and defence, \$1,514,472; public works, \$1,857,627; legislation, \$729,829; and administration of justice, \$765,608. The gross debt of the Dominion was \$338,375,984; assets, \$74,419,585; net debt, \$263,956,399, an increase in a year of \$2,417,800. Of the total assets \$58,359,815 was interest-bearing. Sinking funds held \$40,876,158. A preliminary statement by the Dominion finance department for the fiscal year ending June 30, 1899, showed that the revenue of the consolidated fund was the largest in its history, \$44,698,155, and the expenditure the smallest since 1884, \$33,698,592. It was expected that the settlement of all outstanding accounts would leave a surplus of about \$5,000,000. The public debt was increased by about \$3,000,000, chiefly by new canal work.

Population.—As officially estimated the population in 1898 was 5,248,315, an increase in a year of 62,325. The Indian population was reported at 100,093. There were 273 schools for Indian youth, which had an enrolment of 9886 and an average attendance of 5533. For industrial pursuits of the Indians, see titles of the separate provinces.

HISTORY.

Political Parties.—The chief political parties are the Conservatives and the Liberals. The former were in control of the government from the time of the formation of the Dominion in 1867 to 1896, with the exception of an interval of five years. In 1896 the Liberal party came into power under Sir Wilfred Laurier, the main planks of their platform being gradual free trade, the promotion of foreign trade, and non-interference in provincial affairs, while the chief principles of the Conservative platform at the time were protection, a preferential tariff, internal improvement, and interference on behalf of the Roman Catholics in Manitoba. The less important parties are the McCarthyites, who separated from the Conservatives, and the Patrons of Industry, a Labor party. In 1899 efforts were made to form a stronger labor party which should be independent of the old political organizations. A step in this direction was taken at the Trades and Labor Congress on September 22 in Montreal, where it was resolved that the central bodies of labor in Canada should organize an independent labor party with distinct aims, and that members of labor organizations should cut loose from the old capitalistic political parties.

Parliamentary Session.—The fourth session of the present Parliament was opened by the new governor-general, the Earl of Minto, on March 16, 1899, and came to an end on August 11. Not much legislation marked the session, but many important subjects were discussed. Among these may be mentioned the so-called "Yukon Scandal," which arose from an accusation on the part of the Conservatives that the official administration of the Yukon region was corrupt; the proposed reform of the

Dominion Senate, the redistribution bill, the budget, railway measures, exclusion of oriental immigrants, a life insurance law, and the revision of the criminal code. Another feature of the session was the discussion of the relations between Canada and the United States, the Conservatives being inclined to accuse the Liberal ministry of too great subservience to the interests of the United States in the matter of the Alaskan boundary and the other points in dispute between the two countries.

"The Yukon Scandal."—The ex-premier, Sir Charles Tupper, led the attack on the government for its negligence and corruption in connection with the administration of the Yukon. He charged the Yukon officials with corruptly awarding contracts and liquor licenses, and with favoritism in the records of mining claims. The government's reply consisted in a vigorous denial and in the promise of an investigation. The charges involved the personal character of the present Yukon commissioner and his predecessor, and the minister of the interior also came in for some severe censure. The debate began on the speech in reply to the address from the throne, and took up twenty working days of the session. The Conservatives were voted down by a majority of 53 votes, and Parliament declared its entire confidence in the integrity and ability of the Yukon commissioner, as well as its belief that the commissioner would investigate the charges of maladministration in an impartial and thorough manner. On May 30 the commission appointed to investigate the charges made a partial report, in which the leading officials were completely exonerated. The Conservatives retorted by sharp criticism of the report and by new charges of corruption on the part of the Yukon officials. The administration of the minister of the interior was characterized as grossly negligent and inefficient, and as having recommended the appointment of incapable and corrupt officials. Bribery, breach of trust, blackmail, and the dishonorable use of official information were among the charges. On June 28 a Conservative member, Sir Hibbert Tupper, requested the appointment of a royal commission, but the government was again sustained on June 30 by a majority of 50.

Senate Reform.—For some time there has been a movement to reform the Canadian Senate in such a way as "to bring it into harmony with the principles of popular government." This has been in fact a part of the Liberal programme. Sir Wilfred Laurier, the premier, proposed that in the event of conflict between the two bodies a joint vote should decide the question. The tendency of the Senate to obstruct legislation and the vague limits of its powers seemed to call for some well-defined constitutional restraints. It was held that its powers should be limited and brought under control, and that provision should be made against parliamentary deadlocks in the future. Some favored the reduction of the senatorial term from life membership to a term of years. The provincial legislatures passed resolutions petitioning for an amendment of the constitution to this end. On July 17 the premier offered a resolution requesting the imperial government to introduce an amendment to the constitution which should provide for the joint vote of the members of the two houses in the event of a disagreement between the House and the Senate, such joint vote to have the same force and effect as the vote of the Senate under the present constitution. This resolution, however, was not voted upon, being withdrawn by the premier to expedite the work of the session.

Redistribution.—The British North America Act creating the Canadian constitution provides that the number of representatives from the province of Quebec shall be fixed permanently at 65. The number of inhabitants which shall entitle each of the other provinces to a representative was to be determined at each decennial census by dividing the population of Quebec by this number, 65. In 1881 this division made 20,000 the number of inhabitants entitling a province to one representative, and in 1891, owing to the increase of the population of Quebec, the unit of representation was 23,000. The act provides that on the completion of each decennial census the representation of the four provinces shall be readjusted by such authority and in such a manner and at such time as the Parliament of Canada from time to time provides. Thus it is left for the federal Parliament to introduce a redistribution bill providing for the application of this sliding scale to the changes in the population as revealed by the new census. Redistribution bills were passed by the Conservative government in 1882 and 1892, and the Liberals claimed that on each of these occasions their opponents had made use of their power to gerrymander in their own interest. In fulfilment of their pledge to secure a more equitable basis for representation in Parliament the Liberals introduced a measure, known as the Redistribution bill, in the Commons on May 19. They claimed, however, that it was in no sense a redistribution measure of the character contemplated in the constitution in connection with the readjustment of distribution of representation to conform to changes in the population, but was merely a measure to redress the wrongs committed by their political opponents who had disregarded the county boundaries with a view to securing for themselves a majority of seats. The new measure provided that the boundaries of the new constituencies should coincide with those of the townships and counties, and

that the division of cities and counties into ridings should be made by commissions of judges and not by politicians as before. The effect of this would be practically a redistribution of seats, since from some localities the number of members would be increased and from others diminished. The main changes would take place in the province of Ontario. On the other hand the Conservatives claimed that the measure was violative of the British North America Act, which provided that redistribution should take place only after the decennial census. The bill passed the Commons on July 10, but was rejected ten days later by the Senate on the ground that no readjustment of representation should be considered until after the next decennial census—namely, in 1901.

Railway Legislation.—Two railway bills passed the Commons on June 13, one providing for the government purchase of the Drummond County Railway and the other to "confirm an agreement with the Grand Trunk for use of its lines to provide an extension of the Intercolonial into Montreal." These measures passed the Senate with slight amendments in July. Severe conditions were imposed upon the granting of railway subsidies, which had hitherto been unconditional. These conditions give to the grants the character of perpetual loans, and provide for governmental supervision of the freight rates. The amount of the subsidies voted was more than \$6,000,000, and they were bestowed upon lines that will form a part of the new Trans-Continental system, which will consist of sections of the Great Northern, the Canada Atlantic, Ontario and Rainy River Road, and the Canadian Northern.

Other Parliamentary Matters.—A measure to amend the criminal code was introduced in the Senate, but subsequently withdrawn to facilitate the work of the session. Another proposed measure was a bill for the purpose of adding to the security of policy-holders in life insurance companies. To accomplish this, it changes the interest basis upon which reserves are to be calculated and provides for an extension of the companies' powers in investing their funds. Under the existing act the companies hold their reserve on insurance obligations at an interest of $4\frac{1}{2}$ per cent., while the new act would permit interest at $3\frac{1}{2}$ per cent. According to the budget estimates, the revenue is placed at \$46,600,000 and the expenditure at \$42,000,000. The exclusion of oriental emigrants was aimed at by the legislature of British Columbia, but the act embodying this purpose was disavowed by the Dominion government, probably on grounds of imperial policy. The death of Sir James Edgar rendered necessary the appointment of a new speaker, and on August 1 the office was filled by the election of Mr. Thomas Bain, Liberal member of Parliament for South Wentworth. A new member of the cabinet was appointed on September 30 in the person of Mr. James Sutherland, member of Parliament for North Oxford, who was sworn in as a member without portfolio. The inter-imperial preferential trade measure started by Sir Charles Tupper was negatived on July 21. The Canadian government adopted resolutions of sympathy with the imperial government in the South African war.

Prohibition.—As stated in the last YEAR BOOK, the doubtful results of the prohibition plebiscite did not seem to the ministry to warrant the introduction of a measure of prohibition, and some of the prohibitionists themselves declared that in view of the smallness of the majority in favor of prohibition the government was not justified in legislating a measure along prohibition lines. On March 4, 1899, Sir Wilfred Laurier announced that the government would not support a prohibition measure, saying that no good purpose would be served by forcing such a measure, and the policy had received the support of only about 23 per cent. of the electorate. The more zealous prohibitionists determined, however, to appeal to Parliament against the policy of the ministry. No definite action was taken by Parliament in the matter of prohibition, and as time went on it seemed to be the general opinion, outside of Parliament and in, that the plebiscite was not of a nature to warrant prohibition legislation. At the same time, the opinion of the people was sharply divided on the subject of the proper attitude for the provincial authorities to take in this matter. At a meeting of the Dominion Alliance in Toronto, Ontario, on July 12, a resolution was adopted to the effect that any province whose electors should give a majority in favor of prohibition at the next general federal election should prohibit the sale of intoxicating liquors.

Anglo-American Commission.—The Anglo-American Joint High Commission, appointed in 1898 to consider the points at issue between the United States and Canada, had adjourned before the close of the last record to meet on January 5, 1899. It consisted of the following members: For the United States, Senator Charles W. Fairbanks of Indiana, Senator George Gray of Delaware, Representative Nelson Dingley of Maine, J. W. Foster of Indiana, J. A. Kasson of Iowa, T. Jefferson Coolidge of Massachusetts; for Canada, Sir Wilfred Laurier, premier of Canada; Sir Louis H. Davies, minister of marine and fisheries; Sir Richard Cartwright, John Charlton, M.P., Baron Herschell, Lord Chancellor of England, and Sir James T. Winter, premier of Newfoundland. Senator Gray resigned September 1, 1898, and was succeeded by Senator Charles J. Faulkner of West Virginia. Mr. Dingley of

T. Jefferson Childs, John A. Kasson, Charles J. Folger, Sir Wilfrid Laurier, Sir Lord. Dufferin, Sir James Whitely,



John W. Foster, The Late Nelson Dingley, Charles W. Fairbanks, The Late Lord Herschell, Sir Richard Cartwright, John Charlton,

THE BRITISH AMERICAN JOINT HIGH COMMISSION, CHARGED WITH ADJUSTING ALL OPEN QUESTIONS BETWEEN THE UNITED STATES AND CANADA.

Maine, who died in January, 1899, was succeeded by Representative Sereno E. Payne of New York. Lord Herschell, who died in March, 1899, was succeeded by Baron Russell of Killowen. The chief subjects which the commission was to consider were: The Behring sealing question, reciprocal mining regulations, the Alaskan boundary and restrictive regulations for the preservation of the fisheries of the Great Lakes, the North Atlantic fishery question, the boundary question, the alien labor laws, and reciprocity of trade. In its session early in the year no agreement was reached, and the commission adjourned on February 20, 1899, to meet in Quebec on August 2. Its failure to come to any agreement or to recommend the basis of treaty negotiations occasioned much comment at the time, and some unfounded reports that the session had broken up in discord. The only official statement given out was that substantial progress had been made, but that no agreement had been reported on the Alaskan boundary question. The position of the Canadian representatives in this matter was that the dispute should be referred to a board of arbitration with an umpire, as in the case of the Venezuelan dispute, while the United States representatives argued that the case differed from Venezuela, and that the matter should be submitted to six jurists, three for each country, and that no umpire should be called in unless an umpire from the United States. The Canadian representatives would not agree to this or to the contention of the United States that the status of the tide-water settlements in the disputed region should remain unchanged. The continued failure of negotiations for a settlement of the boundary dispute in the summer of 1899 led to an indefinite postponement of the meeting of the commission beyond the appointed date, August 2. A *modus vivendi*, the terms of which were published in June, was proposed, and if it had been adopted would have taken the difficult question of the boundary out of the hands of the commission, and left it free to decide the other points in dispute; but the agreement upon a *modus vivendi* did not come about in time to prevent the indefinite postponement of the meeting of the commission. For an account of the boundary question see the article ALASKAN BOUNDARY QUESTION.

Other Events of the Year.—It was announced in 1899 that Pope Leo XIII. had decided to send an apostolic delegate to the Roman Catholic Church in Canada to have the general care of ecclesiastical affairs in the country, and to be the supreme representative of the Pope, having functions similar to those exercised by the papal delegate to the United States. The appointment fell to Monsignor Falconia. On May 22 the trackmen on the Grand Trunk Railway struck for an increase of wages, and, the strike threatening to become serious, a Parliamentary board of mediation was appointed. Mediation failed, however, and the strike was resumed, but an agreement was reached in June. The railway consented to take back the strikers into its employ, and to discuss the matter of grievances. In August the men, having accepted the concessions made by the railway company, decided not to renew the strike. The strike on the street railways of London, Ontario, led to a serious riot, which necessitated the calling out of troops to quell. The strikers charged the management with breaking their agreement and with discrimination in favor of non-union men. On July 21, 1899, the new suspension bridge over the Niagara River, to replace the structure destroyed in 1864, was formally opened. The plan for a Pacific cable was again discussed in 1899. It was announced in the spring that an agreement had been reached with the Australian colonies and the home government, whereby the expense of the construction would be divided among the three parts of the empire in the following proportion: The Australasians to pay four-ninths, the rest to fall in equal parts upon the Dominion and the imperial governments. A short time afterward, however, the imperial government declared that it would not contribute to the cost of construction upon this basis, but would merely grant a yearly subsidy, not to exceed \$100,000. This occasioned much disappointment, but the imperial government afterward showed a willingness to reopen the question, and in June the colonies were invited to send delegates to discuss the matter with representatives of the imperial government.

The Lumber Question.—One of the most important subjects before the joint high commission was the question of a tariff on lumber. The Canadian view of the matter is as follows: The United States has long been an important market for Canadian lumber, which is used in the paper-making and other industries. The pulp and timber mills of the United States have been largely supplied from the Canadian forests, and American timber-mill owners have purchased large forest tracts in Canada. The Dingley tariff, however, by placing an import duty of \$2 per 1000 feet of sawn lumber, and increasing the import duty on other wood products, has shut out a large part of this important article of export from Canada. Canada had previously demanded that her lumber should be admitted free of duty into the United States. By way of retaliation upon the duty imposed in the Dingley act, the provincial government of Ontario prohibited the manufacture of timber taken from the Ontario crown

lands in any mills not on Canadian soil. Most of the forests purchased by American mill owners were on these crown lands.

CANALS. The most notable occurrence of the year 1899 in canal construction was the opening of the Soulanges Canal, by which the Canadian government completes the last link in its long-projected 14-foot waterway from the head of Lake Superior to the mouth of the St. Lawrence River. This chain of artificial waterways comprise the following canals:

Names of Canals.	Length. Miles.	Number of Locks.	Lockage. Feet.	Distance from preceding Canal.
St. Mary's.....	0.66	1	18	....
Welland.....	26.75	25	362.75	600 miles
Galops.....	7.625	3	15.5	226 "
Rapids Plat.....	4	2	11.5	4.5 "
Farrens Point.....	0.75	1	4	10.5 "
Cornwall.....	11.5	6	48	5 "
Soulanges.....	14	4	82.5	32.75 "
Lachine.....	8.5	5	45	15.25 "

In the United States the only boat-canal construction of the year, aside from repairs to existing canals, was the completion of the Dismal Swamp Canal, and the continuation of work on the Illinois and Mississippi Canal from Hennepin, Ill., to Rock Island, Ill., 77 miles. This latter canal is being built by the United States government. The Dismal Swamp Canal is 22 miles long, with a depth sufficient for vessels drawing 10 feet of water. It connects Chesapeake Bay with Albermarle Sound, and affords access to about 2500 miles of river and bayou navigation in the Carolinas. It was built by the Lake Drummond Canal and Water Company at a cost of \$1,000,000. The Chicago Drainage Canal, 28 miles long, which has been in process of construction since 1892, was sufficiently advanced toward completion in 1899 to permit water being turned into it. Construction has been progressing actively during the year on the New Orleans, La., drainage canal system, and on the St. Mary's Falls (Mich.) and Massena (N. Y.) water-power canals.

Several projects for canals have developed during the year. Among these the following are worthy of particular mention: Lake Superior-St. Paul Canal, 210 miles long, surveyed in 1899; St. Clair-Erie Canal, length 13 miles, depth 31 feet, width 72 feet, cost \$5,520,000, project revived; Maryland and Delaware Peninsula Canal, project revived; Cape Cod Canal, across Cape Cod, Mass., project revived. In Canada, the Georgian Bay Canal, from Montreal to Lake Huron, was discussed at various public meetings, but nothing definite was done toward its construction.

Trans-Isthmian canal affairs have received much consideration during the year. Near the close of its session in March, 1899, Congress authorized the President to appoint a commission to investigate all the proposed and possible plans for a canal across the Central American Isthmus, and appropriated the sum of \$1,000,000 for defraying the expense of the study. This commission is now at work with a full corps of engineers. In May, 1899, the commission appointed by the government in 1897 to examine into the same question, submitted its report. This commission approved the Nicaragua Canal route, with some modifications, and reported that the cost of the canal would be \$118,113,790. At present the two most notable of the proposed Isthmian Canal routes are the Nicaragua and Panama. These routes will receive particular attention from the new government commission, but all other routes, of which several have been projected, will be considered, and it is probable also that the commission will conduct independent surveys for one or more new routes. See NICARAGUA CANAL.

As the result of the discovery that the completion of the canal improvements in New York State, for which \$9,000,000 was appropriated in 1895-96, and on which work was discontinued in 1898, after consuming the appropriation, would cost \$16,000,000 more, a special commission was appointed by the governor in 1899 to report upon the general question: What shall New York do with her canals? This commission completed an extended investigation during the year, and is expected to report upon the results of its work and the conclusions which it drew from them early in 1900.

In Europe, the most notable canal work completed and in progress in 1899 was the Bruges Ship Canal, and the Dortmund and Ems Ship Canal. The Bruges Ship Canal runs from Bruges, Belgium, to Heyst, 6 miles, and is now in process of construction. The Dortmund and Ems Canal connects the two German cities of that name and has a total length of 175 miles.

CANARIES, or CANARY ISLANDS, a group of islands lying in the Atlantic Ocean, off the northwest coast of Africa, belong to Spain, and are governed as an

integral province of the kingdom. The principal islands are Teneriffe, Grand Canary, Palma, Gomera, Lanzarote, Fuerteventura, and Hierro, or Ferro. The area of the entire group is 2808 square miles, and the population, which in 1887 was 291,625, is now estimated at 300,000. The population of Teneriffe is about 95,000; Grand Canary, 75,000; Palma, 32,000. The seat of local government and the headquarters for the local administration of the other Spanish possessions along the African coast is Teneriffe. The chief products are potatoes, bananas, tomatoes, and cereals.

CANOE. See INSECTS; LIQUID AIR.

CANDIA. See CRETE.

CANTWELL, Mgr. NICHOLAS, vicar-general and rector emeritus of the Church of St. Philip de Neri, Philadelphia, died on November 8, 1899, at age of 87 years, being the oldest priest in Pennsylvania. Father Cantwell labored continuously for the Roman Catholic church in Pennsylvania from the time of his ordination in 1841. He was identified with St. Philip de Neri's church for forty-eight years. The title of monsigneur was conferred on him by the Pope about five years before his death.

CAPE COLONY formerly comprised merely the southernmost portion of Africa in the vicinity of the Cape of Good Hope, but has steadily extended its territory to the north until it now includes with its dependencies an area variously estimated at from 277,000 to 292,000 square miles. In it are included, besides Cape Colony proper, the divisions of Griqualand West, East Griqualand, Tembuland, Transkei, and Walfisch Bay, besides the dependencies of Pondoland, annexed in 1894, and having an estimated area of 4040 square miles and a population of 166,080, and British Bechuanaland, formerly a crown colony and annexed in 1895, and having an area of 51,574 square miles and a population of 72,736 (about 76,000 in 1897). Excluding the population of Pondoland and British Bechuanaland, the population of the colony, according to the census of 1891, was 1,527,224, of whom 376,087 were European or white. The Dutch are more numerous in the western portion of the colony and the English in the eastern. The extreme length of the colony from east to west is about 600 miles and its breadth 450 miles. The coast-line is nearly 1200 miles long.

Production.—A range of mountains divides the colony into two parts. This range runs nearly parallel to the coast at a distance of from 150 to 200 miles from the sea. Between the mountains and the sea on the west lie the chief grain and wine-producing districts, and along the southeastern coast tobacco and maize are raised. A lower range of mountains traverses the country from east to west at a shorter distance from the coast, and the land between the two ranges consists of a dry and elevated tract known as the Great Karroo, which is valuable as a grazing region. North of the mountains the table-land of South Africa begins, and this tract, while barren, affords facilities for grazing, and is rich in mineral products. The climate is generally healthful for Europeans. The chief agricultural and animal products are tobacco, wheat, oats, mealies, corn, rye, hay, wool, mohair, butter, ostrich feathers, etc. Agriculture is largely in the hands of the Dutch, while the English are chiefly engaged in the mineral and other industries. In 1891 the industrial establishments numbered 2230, employing 32,735 persons. Recent statistics in regard to the industries are not available, but there are signs of a great increase in their output. The minerals are copper, coal, manganese, lead ore, iron ore, zinc-blende, and diamonds, of which the last named are by far the most important, the diamond mines supplying, it is said, 98 per cent. of the world's market. In 1898 the minerals and metals, exclusive of diamonds, were exported to the value of £15,663,961. The diamond mines are centred at Kimberley, which in the last few years has attained a rank second only to Cape Town in importance. The city of Kimberley lies 647 miles from Cape Town, and has a population, estimated in 1899, at 35,000. The company controls 200,000 acres of land. The mine is sunk in the crater of an extinct volcano, and is now 612 feet deep. Between 1867 and 1897 the total exportation of rough diamonds from Cape Colony was placed at £83,311,087. The value of the diamonds mined in the colony in 1898 was \$17,751,940, the net profit being \$8,651,639. The cost of labor in Cape Colony is extremely high, but this is to some degree offset to the workmen by the high cost of living. There is a tax of 10 shillings, known as a labor tax, imposed upon every able-bodied male inhabitant who cannot show that he is employed during three months of the year.

Commerce.—A large part of the foreign commerce is due to the diamond mines, the product of these mines being the most important article of export and the supplies needed by them forming a large part of the imports. The supplies for the gold mines in the vicinity of Johannesburg also pass through the Cape. The trade has developed rapidly in recent years. The imports increased from £10,760,556 in 1893 to £16,490,739 in 1897 (\$80,127,495). By far the larger part of the imports came from the United Kingdom, which, in 1897, supplied about one-third, but the share of the United States in the trade of the colony has recently increased. The imports

for 1898 were given by the United States consul in 1899 as \$80,890,252, and \$17,883,355 were "in transit for other states." The most important items in the list of imports were machinery, cotton manufactures, haberdashery and millinery, hardware and cutlery, leather and its manufactures, and clothing. The exports in 1898 were given as £25,318,701 (\$123,213,458), as compared with £21,660,210 in 1897. Gold and diamonds made up the greater part of the exports. Statistics for the six months ending June 30, 1899, place the imports at the ports of Cape Colony at \$42,047,420, and the exports at \$68,181,076. The United States consular reports for December, 1899, show the imports into the colony for the month of July to have been \$8,682,643, as against \$6,259,813 in July, 1898, the increase being due to the large imports of specie. The exports for July, 1899, were \$10,594,370, as compared with \$9,670,217 in July, 1898, the increase being due chiefly to shipments of gold and diamonds. In 1899 the imports into Cape Colony amounted to £19,207,549, as against £16,682,438 in the previous year; the exports of 1899 to £23,333,600, as against £25,318,701 in 1898.

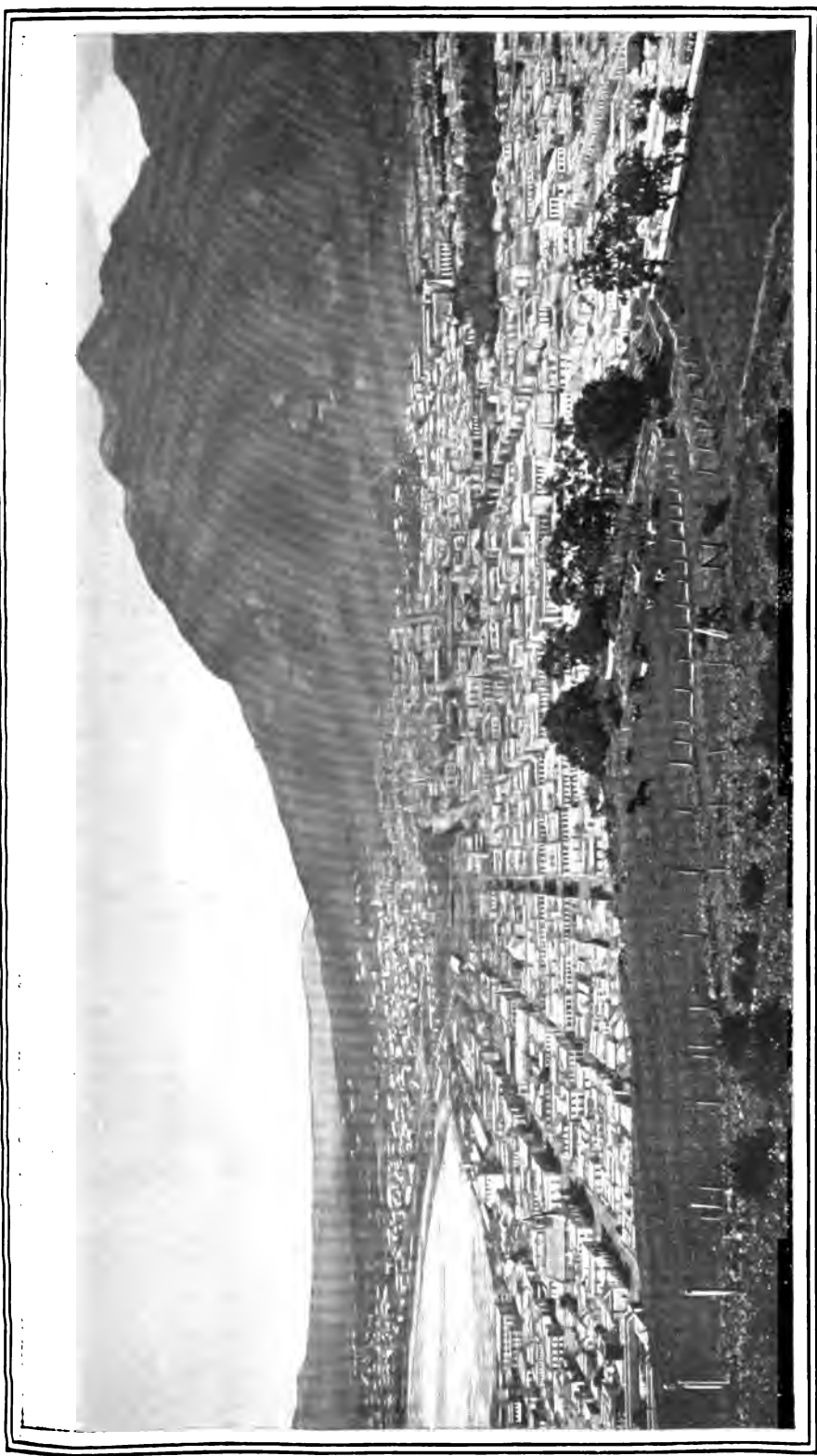
It might be supposed that owing to the British-Boer war, trade in the colony was in 1899 largely at a standstill. On the contrary, it is stated in a United States consular report from Cape Town, under date of December 25, 1899, that American trade in South Africa during the previous three months had been good, as evidenced by the receipts of food-stuffs, mules, horses, etc. The American consul-general at Cape Town reported trade activity in many lines and the likelihood of a large demand for American goods after the close of the war. At the close of the year the seaport cities appeared to be benefiting by the war, while the demand for cattle, sheep, vegetables, and forage is such that, with the resulting advance in prices, the agriculturists were also prospering. Lumber had advanced 25 per cent., and furniture was, therefore, expensive. Tenders for bridge-work, electrical and railway material, and machinery were open for bids. Large shipments of fire-extinguishing apparatus were arriving from London. It was needed, on account of the war, for hand engines and to put out fires caused by shells. The imports of electrical materials for October exceeded those during the corresponding month of 1898 by \$30,000. One article of import—namely, wheat—is sent to Cape Colony almost wholly by the United States. The colony does not begin to supply its own food products, and in 1897 there were imported about 184,455,801 pounds of wheat. Of this amount over 178,000,000 pounds came from the United States. In addition, some American wheat came to the colony through England.

Railways, Shipping, etc.—With the commercial and industrial development of the colony the railway facilities have greatly increased in recent years. In 1899 the railway mileage of the colony was nearly 3000 miles, and of this 1990 were owned and worked by the government, which also operated 650 miles of privately owned railways. A later estimate gives the number owned and worked by the government as 2250 miles. Besides this there is a considerable mileage under private ownership and control. It was estimated in January, 1899, that 343 miles of line were under construction. The telegraph line open in 1899 was 7224 miles. Cape Town is now connected by railway with Kimberley and Buluwayo, the latter forming the southern terminus of the great "Cape to Cairo" railway scheme (*q. v.*). The tonnage of vessels entering the ports of the colony in 1897 was 2,694,370, the majority of the vessels being British. The tonnage of vessels engaged in the coast-wise trade was 3,725,831.

Finance.—The public debt in 1899 was £28,377,921. The revenue for 1898 was £6,321,560, and the expenditure £6,817,000. To meet the deficit the government introduced an income and land tax in 1899, which imposes upon the agricultural classes a tax of a halfpenny to the pound above a value of £1200, and upon the non-agricultural class an income tax of one shilling to the pound upon incomes over £300. The tax upon the agriculturists is thus lighter than upon the industrial classes, and the ground for this is that the prevalence of drought and of disease among cattle and sheep render the former calling very precarious in South Africa. It has been feared that the middle class with incomes ranging from £2000 to £3500 would bear the chief burden of this tax. Budget estimates August 1, 1899, for the current year were: Revenue, £6,544,000; expenditure, £6,878,000.

Defence.—The imperial government maintains a contingent in Cape Colony which in 1890 numbered 80,240 non-commissioned officers and men and 545 officers. Besides these there is a force of Cape mounted rifles numbering 1015, a Cape police about 2000, and volunteers to the number of about 7000. A naval squadron is maintained by the imperial government on the South African coast.

Government.—According to the constitution, which dates from 1872, the executive is vested in a governor with a ministry of five members and the legislative authority in a legislative council of 23 members, and a house of assembly of 79 members, which, in 1899, was increased to 95. Members of the upper house hold office for seven and of the assembly for five years, and the members of both houses are paid. There is a property qualification for suffrage. In 1899 the governor, commander-



GENERAL VIEW OF THE CITY OF CAPE TOWN, THE CAPITAL OF CAPE COLONY, AND THE MAIN BASE OF THE BRITISH CAMPAIGN
IN SOUTH AFRICA.

in-chief in the colony, and the high commissioner for South Africa was Sir Alfred Milner.

History.—In the September elections in 1898 the Afrikaner Bond secured a majority in the legislature, and its strength was increased by the elections for the new seats which had been created by the redistribution act. These elections were held early in the year 1899, and they gave the Afrikaner party a majority of 8 over the Progressives and Independents combined, and a majority of 13 over the Progressives alone. From this time on the main interest in the history of Cape Colony centres in its connection with the dispute between England and the Transvaal. Great disappointment was felt in the colony at the failure of the Bloemfontein conference to reach an agreement, but there was no sign as yet of a falling off in the popularity of Sir Alfred Milner. The Afrikaner leaders, however, naturally sympathized with the Boers, although they did their best to influence President Kruger to grant the necessary reform. Mr. Schreiner, the premier, gave many proofs of loyalty to the imperial government, and of an earnest purpose to prevent the inhabitants of the colony from interfering on behalf of the Boers. As the negotiations went on between England and the Transvaal the Afrikaner element showed its sympathy with the latter by emphatically approving the wise and liberal nature of its concessions, while the Progressives declared their approval of the terms proposed by the high commissioner, Sir Alfred Milner, at the Bloemfontein conference. On August 16, the British commander of the Cape troops, Major-General Sir W. E. Butler, was recalled and replaced by Lieutenant-General Sir F. W. E. Forestier-Walker. In the following month Sir Alfred Milner informed President Steyn, of the Orange Free State, that he intended to move the British troops toward the frontier for the purpose of strengthening the lines of approach. He said that this was not intended as a movement against the Free State, and that a friendly settlement of the differences with the Transvaal was hoped for. President Steyn, however, expressed his regret at this movement of the troops, since the citizens of the Free State would surely regard it as a menace, but he added that he would do what he could to prevent an outbreak. When it appeared that war was inevitable there was an influx of refugees into Cape Town, and among them there were many cases of destitution. Some relief was offered by the sum voted by the town council and by the aid of a citizens' movement on their behalf. Funds also came from the Rand, where a relief committee had been formed, and in London the lord mayor opened the Mansion House Fund, which in a comparatively short time accumulated over \$800,000 for the relief of fugitives. After the ultimatum of the Transvaal reached the Cape the high commissioner issued the proclamation that aiding or abetting the enemy during the state of war constituted the crime of high treason, and at the same time the premier, Mr. Schreiner, addressed the citizens in a circular, urging them not to act upon race antagonism and to remain loyal to the imperial government. His policy was to keep Cape Colony out of the war. Cape Colony, however, with Natal, was the scene of the earliest hostilities, and they continued to be the seat of war throughout the year. The first movement of the British was to send all the available troops to De Aar, a junction on the Cape railway system. The British were enforced also at Kimberley and Mafeking, but at Vryburg there was an insufficient force, and it soon fell into the hands of the enemy. Kimberley and Mafeking were cut off from communication with the south by the breaking up of the railway and telegraph lines. Early in November the Boers, having seized the bridges over the Orange River, began to advance in strength into the colony, and the British retreated a short distance before them in order to occupy stronger positions farther south. See TRANSVAAL.

Political and Social Conditions.—The social and political conditions of Cape Colony, so far as they are of importance in connection with the war between England and the Transvaal, include, under the first head, racial and religious questions, and in political matters the possible disaffection of the Cape Boers and Kaffirs through sympathy with the enemy or because of impatience with their present political status. The Afrikaner sentiment has been fostered and stimulated ever since the Great Trek. Nevertheless the condition of the Cape Colony native, whose numeric proportion to whites is about 3 to 1, is still such as to arouse the fear in some minds that he may seize the present opportunity for an uprising. Although there seems to be no reasonable basis for adopting this advanced opinion, the British treatment of the negroes is not entirely a progressive one. The color line in Cape Colony is strongly drawn. The native has no vote and no representation, and in other ways he is treated as a person of little importance. At the same time he must carry a pass wherever he goes, stating his business and destination, and must not be out of his quarters at night. A law discriminating against the negro, under the Glen Grey act, which is enforced in the Lady Frere district, and which is being extended to other native territories, compels many natives to pay nearly six times more for their morgen, or two acres of land, than is paid by the average European farmer of

the colony. This act, however, has its advantages, having secured the land to the natives when there had been an attempt to wrest it from them by the Dutch. Besides the political and social elements, religious questions have been mentioned during the past year as playing a part in the native unrest. A certain missionary, writing in the *Nineteenth Century*, records the growth of the Ethiopian church as a movement, in his opinion, of some magnitude. The Kaffirs dislike, he says, the white missionaries' disapproval of native customs, and there is a strong sentiment among them in favor of making the negro church their own, since they have unequal treatment with the whites and no opportunity for ecclesiastical advancement. In pursuance of this they wish to abolish European church control. In this movement the writer sees another evidence of a slumbering sense of oppression, and dissatisfaction with European methods and rule. From the facts as presented, however, it would seem more like a natural flocking of the negroes by themselves, as in the American colored denominations, rather than an event of political significance. The most important outside element in the population of the English Cape Colony is, of course, that of the Boers, who number, roughly, about 230,000, to 146,000 of British and other Europeans. The political attitude of these colonists is the real matter of concern in considering the possible disaffection of the Cape. In their characteristics the Dutch and British residents are antithetic. The more stolid Dutch are largely pastoral and agricultural farmers, and to some extent are engaged in the cultivation of tobacco and the vine. They are increasing both in total population and their number of voters. The British are largely attracted to the colony by mining and commercial schemes. They live more in the towns and cities, and make up a population of a less permanent, though more progressive, character. Except in the towns there is little fusion of races. In the back country the Boer lives under conditions which are alien to the modern Englishman. Thus there are in a way two nations growing up within the colony, with distinct customs and ideals. Sympathy with the Transvaalers on the part of the Cape Colony Dutch would not be surprising, therefore, should it be actively shown. Some writers are of the opinion also that the historic sentiment for a Dutch republic, embracing all South Africa, still exists among the Transvaal, Free State, Natal, and Cape descendants of the Dutch who settled within the old Cape Colony, south of the Orange River, years ago. It has even been asserted that proof of this is in the possession of the English colonial office. If these facts are true it means that President Kruger really has the support of his compatriots in the Cape and other British colonies. The reported sympathy at heart between the Cape and Transvaal Dutch was, in fact, disclosed before the ending of the year.

"CAPE TO CAIRO" RAILWAY is the title by which the project of Mr. Cecil Rhodes for a line to traverse the entire length of the continent of Africa is known, although Alexandria and not Cairo is planned for its northern terminus. When Mr. Rhodes proposed a telegraph line from the Cape to Cairo some years ago the project found small favor with investors. Nevertheless the telegraph line has made great progress, and in 1899 was being pushed forward to the southern end of Lake Tanganyika. The total distance to be covered is 6600 miles. Mr. Rhodes started from the northern limit of the Cape telegraph system and built through Bechuanaland as far as Buluwayo and a point in Mashonaland, a distance of 1800 miles from the Cape. From northeastern Mashonaland it passes northward across Portuguese territory, passing over the Zambesi River at Tete, and joining the telegraphic system of Nyassaland at Blantyre, thence it passes northward and along the western shore of Lake Nyassa to Karonga on its western coast, which it reached in December, 1898. Thence it runs westward to the southern point of Lake Tanganyika, which was reported to have been reached in 1899. A large section of the system had already been built in the north by the Egyptian government under the control of British officers. It extends through Wady Halfa as far as Khartoum, 1300 miles from Cairo. The southern portion of this line was inoperative during a period of the Mahdi's domination, but the Khartoum telegraph office was reopened when the Anglo-Egyptian expedition reached that point in 1898. Subtracting the 1300 miles already constructed in the north and 2500 miles from the Cape to Abercorn, at the southern end of Lake Tanganyika, there remain only 2800 miles to be constructed. In 1899 it was said that the line would be finished in five years' time. Its financial prospects were good, the chief practical result of it being a reduction of the cost of telegraphing to South Africa, which is from 84 cents to \$1.20 a word. As to the cost it has been estimated at \$375 a mile on the average, and on this basis the total cost would be less than \$2,500,000. At Abercorn it will pass through German territory to the east of Lake Tanganyika, and then enter British territory again, and pass near Mengo in Uganda, and northward until it joins the Anglo-Egyptian line on the frontier of the Soudan. Thus only 700 miles of its course would pass through German territory. Permission to construct the line on German land was granted by the German government, but on the condition, it was said, that Mr. Rhodes should

lay down at his own cost a separate line between Rhodesia and British East Africa, which should be under the exclusive control of the German authorities, and which should be operated by them at his expense. At the end of forty years the German government might appropriate the line without compensation. The railway project involves far greater difficulty and its prospects are more doubtful. It has been criticised on the ground that it could not be worked except at a loss, and that there are other points in the African continent which are in far greater need of railway communication than Cape Colony and Cairo. Moreover, it has been estimated that the shortening of the distance between London and the Cape would be a matter of only two or three days. At present, including the four or five days between London and Cairo, the journey to the Cape by sea takes only seventeen or eighteen days, and the overland route would reduce the time to fifteen or sixteen days. The cost has been placed by some as high as \$100,000,000. At the same time it seemed probable in 1899 that the work would be carried out, and the date commonly given for its completion was 1909. There are two sections of the line now practically complete, one in the north from Cairo to Khartoum and the other in the south. Mr. Rhodes has been the chief factor in the construction of the southern section. He began by building a line from Vryburg in Bechuanaland to Buluwayo in Rhodesia, a distance of 600 miles. In this the railway company was subsidized by the chartered South Africa Company, and the cost was about \$10,000,000, toward which the home government contributed \$1,000,000. The next step is now being taken. It consists in the extension of the Bechuanaland Railway to the mineral region of Rhodesia, a section which would need to be built whether or not the greater project was carried out. This line is in process of construction. It will cross the Zambesi at a point near the Portuguese frontier. Mr. Rhodes expects to carry the road across the Zambesi in five years. The line north of this point is all a matter of vague speculation. From the Zambesi it is proposed to carry it northward to the west of Zumbo, between Lake Bangweolo and Nyassa to the southern point of Lake Tanganyika, at which point it will enter German territory. In 1899 Mr. Rhodes visited the German Emperor to obtain permission to carry the line through his African lands. No authenticated report of the results of the interview was made public, but it was said that while the Germans would guarantee no material aid, they consented to the passage of the line through their territory. The northern section of the road was carried forward as a part of the Anglo-Egyptian campaign in 1897 and 1898. As Lord Kitchener advanced into the interior he constructed the railway line toward Khartoum, completing it as far as the Atbara. At this point progress was checked by the necessity of building a bridge. It was necessary to finish the work before the July floods, but the bids offered by British bridge-builders called for too long a space of time. Fresh bids were invited, and an American firm received the order, having engaged to build the work in a space of time and at a price which the British builders could not approach. Seven spans for the bridge were on their way from New York harbor within the thirty-seven days after the receipt of the order. The line from the Atbara to Khartoum is now in process of construction. From Khartoum the direction of the road has not yet been settled. The mileage required to complete the line through the intermediate space is variously estimated according to the extent to which it is proposed to rely upon the water-ways. If the waters of Lake Nyassa, Lake Tanganyika, and Lake Victoria Nyanza were utilized about 1100 miles would be gained, and the total number of miles required for establishing complete connection would be about 1750. If the Nile were traversed from Khartoum to the Albert Nyanza 750 more miles would be gained, and the mileage necessary for completion of the line would be about 1000, but Mr. Rhodes' project appears to call for the building of a line over this 750 miles. Throughout the eastern part of Africa, running from Suakim down to Table Mountain, there is a series of mountain ranges from which the country to the eastward falls rapidly to the coast. To the west it slopes gradually toward the great plateaus of the interior. The "Cape to Cairo" railway would run for the most part along the crest of this plateau, which, on the whole, is the most healthful portion of Africa. Native labor, which would be the main reliance in the building of the road, is not only cheap, but efficient, as appears from the experience of railway building in the south. A large part of the line would lie in the country of the Bantus, who are one of the most intelligent and progressive races of Africa. A matter of great importance is the extent to which side lines would connect the Trans-Continental Railway with the coast. Of these side lines the following are already built or in process of construction: First, the Natal Railway, from Durban into the Transvaal; second, the Delagoa Bay Railway from Delagoa Bay to the interior of the Transvaal; third, the Beira Railway, entering Rhodesia at Umtali, whence there is communication with Salisbury; fourth, the German East African Railway from the seacoast to the western part of the German protectorate, with branches to Lake Tanganyika and Lake Victoria Nyanza; fifth, the British East African Railway, from

Mombasa to the Victoria Nyanza, a part of which has been built. No further eastward branches would tap the main line to the north of this British East African Railway, and the sea would not be reached except at Suakim, to which a line is proposed either via Kassala or via Berber. Of the eastward branches, two are in process of construction and two are merely proposed. The two now built are a Portuguese line extending from St. Paul de Loanda toward Lake Tanganyika, and a Belgian line extending from Matadi toward Uganda. The two proposed are to connect Lake Tchad with Fashoda and Walfisch with Buluwayo. The cost of building the new portions of the Trans-Continental line is estimated by Mr. Rhodes at \$50,000,000, which is regarded by some as a too sanguine estimate, since the engineering difficulties in the central section would be far greater than in the sections already built.

CAPE VERDE ISLANDS, a group of fourteen islands belonging to Portugal and lying about 320 miles west of the cape from which they take their name, have an area of from 1480 to 1650 square miles, with a population estimated at from 114,130 to 120,000, consisting of a mixed race of Portuguese and negroes, the negro element predominating. The chief products are sugar, cotton, coffee, tobacco, tamarinds, indigo, millet, and medicinal products. Portugal is the chief sharer in the commerce, which in 1896 amounted to about \$2,141,000. There is a trade with the United States in goat-skins, rum, and salt, and the islands import from the United States flour, lumber, Indian corn, and denims. The islands are administered by a governor, whose residence is at Praia, the capital.

CAPRIVI DE CAPRARA DE MONTECUCOLI, Count GEORG LEO VON, the successor of Bismarck as chancellor of the German Empire, died at Skyren, near Krossen, February 6, 1899. Caprivi had an international reputation as soldier and statesman, and in Germany was one of the powerful forces of his time, though he was overshadowed by his contemporaries, Von Moltke and Bismarck, the one in the army and the other in the state. He was born February 24, 1831, in Berlin, where he was educated. In April, 1849, he entered the Kaiser Franz Grenadiers; in 1850, having meanwhile attended the military college, he was made second lieutenant; in 1859 was promoted to the rank of first lieutenant; in 1861 to that of captain on the general staff, and in 1865 he was placed in command of a company in the Sixty-fourth Regiment. He was made a major in 1866, and served as a staff-officer of the First Army Corps in Bohemia; in 1870 he was given a lieutenant-colonelcy, and served as chief of staff of the Tenth Army Corps, which position he held during the Franco-Prussian War. He distinguished himself at Metz and Orleans, and in the following Loire campaign. He was commissioned colonel in 1872, having supervision of a bureau under the war department. He was advanced to the rank of major-general in 1877, and in the following year had command of a brigade at Stettin and of a brigade at Berlin in 1881. In December, 1882, he was made lieutenant-general and commander of the Thirtieth Infantry Corps at Metz. After the resignation of Admiral Stosch, Caprivi was made chief of the ministry of marine in March, 1883, and was given the rank of vice-admiral. On account of his inexperience in the navy this appointment caused much dissatisfaction among the naval officers. But he showed such knowledge and mastery in the department that all fears on account of any supposed inability were allayed. He reorganized the navy department, and placed it on its present footing. He gave much attention to the development of torpedoes and torpedo boats, to the improvement of naval tactics, and to plans for the more rapid mobilization of warships. He resigned in 1888 and was made commanding general of the Tenth Army Corps in Hanover.

In March, 1890, he was appointed by Kaiser William II. to succeed Bismarck as imperial chancellor and president of the Prussian council. As chancellor the career of Caprivi was troubled, but he performed his duties with great faithfulness. Despite much opposition, he carried the German army bill successfully through both the Reichstag and the Prussian Landtag. In 1892 he incurred the hostility of German land-owners by effecting with Austria, Italy, and Russia reciprocity treaties which allowed the competition of foreign cereals in Germany, and thus reduced prices on these staples. By a high protective tariff Bismarck had kept out such competition. Of course, the change was welcomed largely by the manufacturing and non-agricultural parts of the population, and though at one time Caprivi bitterly opposed the Socialists, he was finally accused by the landed aristocracy of showing them favor. The truth, doubtless, is not that he favored Socialism, but that he saw the folly of the extreme anti-Socialistic measures. In 1892 he resigned the presidency of the council and the chancellorship in 1894.

Caprivi was a member of the order of the Black Eagle. He was made a count by the Emperor in 1891. Both in physique and in character he resembled to some extent his great predecessor in the chancellorship, Bismarck. Like the latter, he was a man of force and will, but in address was more agreeable. He combined sagacity with

more of patience and good-humor than Bismarck, and in general was far more of a favorite. Upon hearing of his death Emperor William telegraphed to General von Müller, Caprivi's nephew: "Count Caprivi was always highly esteemed as a soldier by his commanders-in-chief. As imperial chancellor he co-operated with me, and manifested delight in his work and fidelity to his convictions. In the seclusion of his retirement he continued to show that he could deserve recognition and the gratitude of his King and Emperor."

CARBORUNDUM. The production of carborundum in the United States in 1899 was about 1,632,407 pounds, and its use as a substitute for emery and corundum showed a decided advance. Besides its growing use as an abrasive, the new material has been employed as a substitute for ferrosilicon in steel manufacture, and in its amorphous form as a refractory lining for furnaces and in the manufacture of refractory bricks, crucibles, etc. The manufacture of carborundum is controlled by one company having a plant at Niagara Falls, N. Y.

CARDINAL. In the Roman Catholic Church the cardinals—bishops, priests, and deacons—are next in dignity to the Pope, and the new popes are elected from the list of cardinals. The names and dates of consecration are given in the subjoined list:

Cardinal Bishops: C. Mazzella (1886); M. Mocenni (1893); L. M. Parocchi (1877); G. Prisco (1896); L. O. S. Stefano (1873); S. Vannutelli (1887). Cardinal Priests: A. Agliardi (1896); Masella Aloisi (1885); A. Capeceaturo (1885); G. Casali del Drago (1899); A. M. Cassajares (1895); S. Cassanas (1895); F. Cassetta (1899); P. Cesia (1884); A. Ciasca (1899); L. Conille (1897); S. Cretoni (1896); L. di Canossa (1897); A. di Pietro (1893); A. Ferrari (1894); D. Ferrata (1896); G. Francica Nava (1899); S. Gabati (1890); J. Gibbons (1886); Goossens (1889); G. M. Gotti (1895); A. J. Gruscha (1891); T. Haller (1895); T. Herrera (1897); D. M. Jacobini (1896); G. Kopp (1893); F. Laboure (1897); B. M. Laugenieux (1886); V. L. Lecot (1893); M. Ledochowski (1872); Michael Logue (1893); A. Manara (1895); F. Mathieu (1899); J. Missia (1899); P. F. Moran (1885); J. S. Netto (1884); J. Portanova (1899); M. Rampolla (1887); P. Respighi (1899); F. M. Richard (1889); A. Richelmy (1899); C. M. Sancha (1894); J. Sarto (1893); F. Satolli (1895); L. Schlauch (1893); D. Svampa (1894); V. Vannutelli (1890); H. Vaughan (1893); C. Vaszary (1893). Cardinal Deacons: L. Macchi (1889); R. Pierotti; F. Segna (1894); A. Steinhuber (1895); L. Trombetta (1891); J. Vives y Tuto (1899).

CARLOS, DON, DUKE OF MADRID, grand-nephew of Ferdinand VII., who claims the Spanish throne on the ground that Isabella, daughter of Ferdinand VII. and mother of Alfonso XII., was debarred from the succession owing to the Salic law, was born at Laybach, Austria, March 30, 1848. His grandfather and uncle (Charles V. and Charles VII.) took up arms in their cause. Don Juan, the father of Don Carlos, yielded his rights to this son in 1868, and the standard of the latter was raised in Spain in 1872. Don Carlos entered Spain July 15, 1873, and waged war with great vigor. In 1876 Tolosa fell and the Carlists fled to France. Don Carlos crossed to London and sailed for the United States and Mexico. In 1877 he served in the Russian army in Turkey, and was decorated by the Czar for his services. In 1880 he went to France, but President Grévy expelled him for attending mass with the Royalists in honor of the Comte de Chambord. In 1884 he visited India and in 1887 South America. Don Carlos lives principally in his palace in Venice, and it is said that he awaits a favorable opportunity for reasserting his old claim to the Spanish throne. As undisputed heir of the House of Bourbon (his father having died in 1887) he has also a right to the throne of France, and has frequently been urged by the Royalists to bring his claim forward. His first wife was Marguerite, Princess of Bourbon-Parma, and his second wife Marie-Berthe, Princess de Rohan. Don Carlos has five children, his heir being the Infante, Don Jaime, Prince of the Asturias, born June 27, 1870.

CARNEGIE, ANDREW, manufacturer and philanthropist, was born in Dunfermline, Scotland, in 1835, his family emigrating to the United States in 1845 and settling in Allegheny, Penn. He made a fortune in oil, became interested in iron works at Pittsburg, and soon became known as the largest manufacturer of iron, steel rails, and coke in the world. His public gifts are very large, including many endowments and the establishment of a large number of libraries in this country and Scotland, and aggregated in 1899 millions of dollars. Some of his larger gifts include the Carnegie Institute at Pittsburg, endowed at \$3,000,000, but in receipt, all told, of about \$7,000,000; a similar institution at Allegheny, \$300,000; the Braddock, Homestead, and Duquesne institutes in Pennsylvania, \$500,000 each, and the Washington, Carnegie, Edinburgh, and Pennsylvania State College libraries. Altogether he has founded more than twenty libraries, half of which are in Scotland. Among his gifts in 1899 may be mentioned a very large endowment for a technical department at Birmingham University, England, on the plan of the American technical schools;

gifts to Stevens Institute; to the Carnegie Library; toward establishing a library at Banff, Scotland, and a large gift to the Atlanta, Ga., public library. In May, 1899, the announcement was made that Mr. Carnegie was to retire from active business and sell to his business associates his controlling interest in the great iron and steel plants under his management, which were to be consolidated under one concern. It was reported that \$150,000,000 was the sum to be received for these interests. The reported sale attracted great attention both in this country and abroad, but in November it was announced that the proposed reorganization of the various companies had been abandoned, and that Mr. Carnegie would continue to direct the business, no change being made in organization, ownership, or policy. In December the retirement of Mr. H. C. Frick from the chairmanship of the Carnegie Steel Company was announced. Besides his prominence in business and as a philanthropist, Mr. Carnegie is known as a writer, among his publications being *An American Four-in-Hand in Britain*; *Round the World*, and *Triumphant Democracy*. In 1899 he contributed a number of articles to American magazines opposing the policy of the administration in the Philippines.

CAROLINE ISLANDS, an archipelago in the Pacific Ocean, extending between the 3d and 11th parallels of north latitude and from the 133d east meridian to the 167th, a distance of more than 2000 miles. The islands were under Spanish authority from 1885 to 1899. On February 12 of the latter year a treaty was signed between Spain and Germany, according to the terms of which the Carolines, together with Ladrões, or Marianne Islands (except Guam), were sold to the latter power for the sum of 25,000,000 pesetas (\$4,825,000), and the purchase was formally announced by the Spanish and German governments early in June. The group was put under the governor of German New Guinea. The total area of the Carolines is about 560 square miles, and the estimated population, 36,000. The islands are about 500 in number, and comprise 36 small groups, the chief ones being the Pelews, or Palaos, Yap, Uluthi, Uleai, Namonuito, Ruk, or Hugoleu, the Mortlocks, Ponapé, or Bonabé, and Kusaie, sometimes known as Ualan, or Strong's Island. There is a European settlement at Tomil Harbor, in the Pelews, one of the western groups. The chief port and trading place of the Uluthi group is Arrowroot, or Mokomok. On Ponapé, one of the most important islands of the eastern group, there is a small Spanish colony at Santiago, on Asuncion Bay. The commercial products of the islands are few and unimportant; they include turtle-shell, copra, and *bêche de mer*, while fruits, especially yam, bread fruit, and cocoanuts, are grown in large quantities.

The natives are a mixed race, apparently being "a cross between round-headed, light-colored Malay folk and the long-headed, almost black, crisp-haired, earlier islanders, the so-called Melanesians." The inhabitants of the various islands present different characteristics, some being surly and suspicious and others kindly and hospitable, but all are alike in having a strong hatred for the Spaniard.

When the Spanish flag was raised in the archipelago there were in Ponapé and some of the other islands flourishing Methodist missions, and within a year Roman Catholic missions were introduced, which finally brought about the expulsion of the Protestants and the confiscation of mission property, for which in 1890 Spain was obliged by the United States government to pay an indemnity of \$17,000. From 1887 till 1899 the natives made intermittent revolts against the Spaniards. In a few of the islands, particularly Ponapé and Ualan, there are groups of ruins, which are the work of a race unknown to the present inhabitants. These remains of a prehistoric time consist chiefly of breakwaters, canals, and massive stone fortifications. In Ponapé the stone constructions, which are generally rectangular in form, cover an area of about eleven square miles, the exterior walls being from eight to ten feet thick and sometimes forty feet high, and enclosing canals and some fifty walled islets. These enclosures, protected from the sea by the massive walls and breakwaters, seem to have been designed for fortresses, temples, and mausoleums. According to native legend, their construction is attributed to the supernatural agency of two deified heroes—Olo-chipa and Olo-chopa. Apparently the stones, which are natural prisms of basalt, and many of which weigh several tons, were brought by raft from the north side of the island and then by means of inclined planes and rollers were placed in position, being arranged in alternation longitudinally and transversely. There is a legend in Ponapé that the earlier culture was destroyed by a fierce race, whose leader became the war-god, called Ichō-kalakal by the present inhabitants.

CAROLUS-DURAN. See DURAN, ÉMILE AUGUSTE CAROLUS.

CARPENTER, CHARLES C., rear-admiral, U.S.N., retired, committed suicide at a sanitarium in Jamaica Plain, Mass., April 2, 1899. He was born at Greenfield, Mass., February 27, 1834; entered the navy as midshipman in 1850; in 1855-56 was in the Naval Academy at Annapolis, and in 1858 became a lieutenant. He was attached to the steamer *Mohawk*, which, after the outbreak of the Civil War, was

placed in the Texas and the East Gulf blockading squadron. In 1862 Carpenter was transferred to the *Flag*, of the South Atlantic squadron, and in July was promoted to the rank of lieutenant-commander. The next year he was serving on the monitor *Catskill* when that boat took part in the attacks upon Charleston, S. C., in April, July, and August. During the latter part of the war he was at the Naval Academy. When hostilities were ended he was sent to the Asiatic station, where he received his first command, the *Wyoming*. He returned to America, and was stationed at the Portsmouth Navy Yard for two years, during which time he was commissioned commander. He commanded the *Nantasket* in 1871-72, and then returned to Portsmouth, serving on equipment duty for three years. In 1875-76 he commanded the *Huron*, of the North Atlantic squadron, when he again resumed duty at Portsmouth, where he was promoted to the rank of captain in March, 1880. After three years of shore duty at the Boston Navy Yard he took command of the *Hartford*, which carried the English and American eclipse expedition to the Caroline atoll. From 1888 to 1890 he commanded the receiving-ship *Wabash*, and in June of the latter year was transferred to Portsmouth, where he was made captain of the yard, becoming later commandant. In 1893 he was commissioned commodore, and rear-admiral in 1894. In this year as commander of the Asiatic squadron he witnessed several naval movements of the Chino-Japanese war. He was retired in 1896. Upon the outbreak of the Spanish-American war the offer of his services was accepted by Secretary of the Navy Long, and he was assigned to his old command of the Portsmouth Yard, relieving Commodore Remey, who in turn was given command of the naval station at Key West.

CARS. See RAILWAYS (paragraph Cars).

CASTELAR, EMILIO, Spanish statesman and author, was born in Cadiz, September 8, 1832; died at Murcia, Spain, May 25, 1899. In early life he was left in straitened circumstances, but secured a good education. While still a boy he wrote much, and in his early twenties gained no small reputation for his political orations, the opinions expressed at this time being of an advanced radical nature. In 1856 he was appointed professor of history in the University of Madrid. His career, now fairly begun, proved to be a remarkable one for its political journalism, oratory, statesmanship, authorship, and activity in the cause of republicanism in Spain. In 1864, with Carrasen, he founded *La Democracia*, a radical paper, and thereby lost his professorship in the university. Two years later the publication was suppressed, and Castelar, having taken part in the uprising against the government (June, 1866), was sentenced to death, but he succeeded in escaping to Geneva. Upon the outbreak of the revolution of 1868 he returned to Spain, became a leader of the republican party, and resumed his professorship at Madrid. Castelar protested against the restoration of the monarchy and demanded the proclamation of a republic. He was unsuccessful, however, and though he was returned to the Cortes, the republicans were generally beaten at the polls, and the next year (1870) the Duke of Aosta was proclaimed king as Amadeo I. Upon the abdication of Amadeo two years later, a republic was proclaimed, and Castelar became premier and minister of foreign affairs. He was elected to the presidency of the Cortes in August, 1873, but resigned the following month upon his nomination for president of the republic. Being elected to this office, he assumed an autocratic position; his task was by no means an easy one, for he had to meet the insubordination of his generals and the menacing attempts of the Carlists. When the Cortes reassembled in January, 1874, a vote of confidence in Castelar was defeated, whereupon he resigned. This was the beginning of the end of the republic, and on December 14, 1874, Alfonso XII. ascended the throne of the restored kingdom. Castelar went to Switzerland, resigning the chair of history in the university. He subsequently became, however, a leader in the Spanish republican party, and to the last remained one of the chief exponents of democratic ideas in Spain, though in his latest years his influence in politics was greatly diminished. Upon his retirement from public life in 1893, he said that the monarchy was the only stable form of government possible for Spain. He was formerly a great admirer of the United States, but vehemently denounced this country when it espoused the Cuban cause. In April, 1899, Castelar was elected to the Cortes from Murcia, but he declined to serve. His writings include novels, histories, books of travel, essays, poems, parliamentary discourses, many of which have been read widely in Europe and America. Among these may be mentioned a life of Columbus and *Old Rome and New Italy*. Castelar was eminent as an orator, and as a writer, like so many other Spaniards, was notable for a florid style.

CASTNER, HAMILTON YOUNG, American chemist, died at Saranac Lake, N. Y., October 11, 1899. He was born Brooklyn, N. Y., September 11, 1859. After receiving a common school education he entered the Columbia College School of Mines and was graduated in 1878. Having devoted himself especially to chemistry, he opened an analytical laboratory in New York City. He gave his attention par-

ticularly to the improvement of chemical processes, and some of his inventions have been of much value. He succeeded in finding a method by which carbon could be produced continuously; he improved the chemical process for the production of aluminium, and later succeeded in finding an electrolytic method for the manufacture of bicarbonate of soda. Besides these, he developed or originated many processes. Mr. Castner supervised the erection of the aluminium plant at Oldbury, England, and was associated with the Castner-Kellner Company, the Malthiessen Alkali Company, the Rheinfelsen Company, and the Niagara Chemical Company.

CATARGI, LASCAR, Roumanian statesman, died at Bucharest, April 11, 1899. He was born in Moldavia in November, 1823. He entered politics, and rose to the position of premier. He held this office from 1891 to 1895. When the union of the Danubian principalities, Wallachia and Moldavia, was formed, and under the name Roumania the two were acknowledged by the Porte in 1861, Catargi was prominent in effecting the consolidation of the new nationality.

CAUCASUS, a Russian lieutenancy, lying on both sides of the mountain range of the same name, which extends between the Black Sea and the Caspian. It has an area of 180,843 square miles and a population, according to the census of 1897, of 9,248,695, with a density of 54 per square mile. The ratio between the sexes was 89.5 women for every 100 men. There is a great variety of ethnic elements, the Russians being the most numerous, the Tartars next, and the Armenians next. Besides these, there are Turks, Northern Tartars, Persians, Georgians, Mingrelians, Imeretes, Ossets, etc. The birth rate, based on the statistics of 1895, was 41.3 and the death rate, 26.1.

CAVENDISE. See JONES, HENRY.

CELEBES, a large island of the East Indies, lying in the Pacific Ocean, east of Borneo, and having an area of 71,470 square miles, with a population roughly estimated at the end of 1897 at 2,000,000. The whole of the island is practically under the control of the Dutch, who, however, administer directly only a small portion, and in the other parts permit the petty princes to manage local affairs. It is divided into two residencies in accordance with the Dutch system for the administration of the colony. The part of the island which is directly under the Dutch administration forms an "outpost" of Dutch India. It constitutes the towns of Mendo, Port Rotterdam, and Vlaardingen or Macassar. A somewhat similar system to that existing in Java (*q. v.*) is employed in Celebes for the purpose of solving the labor question. After the introduction of the coffee plant the village chiefs were induced to undertake the work of cultivation. These chiefs were to receive five per cent. of the produce. It was sold at a fixed price to the government. The industry progressed rapidly, and the country was opened up by roads and supplied with clothing and luxuries. The system of *controlleurs* was introduced. This consisted in assigning to each district into which the country was divided a controleur, who was a European, or a native of European blood, as the superintendent of the cultivation of the district and the general adviser of the chief and the go-between for local interests and the government.

CEMENTS. See HYDRAULIC CEMENTS.

CENSUS IN THE UNITED STATES. In the last session of the Fifty-fifth Congress an act was passed providing for the taking of the Twelfth Census in 1900. This act created a census bureau to which civil service rules were not extended. The three hundred supervisors who will have charge of the 40,000 enumerators in the different districts are to be appointed by the President and confirmed by the Senate. The clerks at the census office, together with all the other employees authorized by the act below the assistant director, are to be appointed by the director, subject to such an examination as he may prescribe, but no examination is to be required for those positions for which a salary less than \$600 is paid. On March 4, 1899, ex-Governor William R. Merriam, of Minnesota, was nominated director, and shortly afterward Mr. Frederick Howard Wines, of Illinois, was nominated assistant director. Ex-Governor Merriam, while having no special qualification as a statistician, had been a successful business man and state official. Assistant Director F. H. Wines was a special agent of the Tenth and Eleventh Censuses and is a well-known statistician and the author of *Punishment and Reformation*. The technical and scientific portion of the work will be done by the assistant director. A general statement was issued by Mr. Merriam, outlining the policy of the office in making appointments. He declared that the appointments would be based upon fitness, and that as much regard would be paid to the merits of candidates as if the civil service rules were in force.

Administrative Organization.—The Census law of 1899 is in some respects superior to any previous census acts. It makes a sharp distinction between the executive and statistical branches of the work. It provides for the prompt completion of those

lines of investigation which have been the chief objects of the censuses, and postpones the more special work until this has been done. It provides for a director at a salary of \$6000 a year, who has the general charge of the administration, and an assistant director at \$4000, who is a trained statistician and who has the general oversight of the statistical bureaus. There are also five chief statisticians, each of whom is in charge of a special branch of the work, and has been chosen with reference to his attainments in that branch. For the completion of the four principal subjects of census investigation—namely, population, vital statistics, agriculture, and manufactures—two years from June, 1900, have been allotted. The 300 supervisors provided for in the law have charge of the work in the various census districts and choose the enumerators, of whom the director estimates there will be between 40,000 and 50,000. The actual account must be completed, according to the law, within fifteen days in the cities and thirty days in the country districts, and the enumeration districts are not to comprise a population of more than 2000. These supervisors were chosen in 1899 in the hope that by appointing them early they would be enabled to perform their duties within the required time. The value of the work depends in large degree upon the character of these supervisors, and one of the defects of every census has been the difficulty of securing suitable men for work which is not permanent in character. The plans for the census, so far as they were formulated in 1899, look to greater centralization of the system. It was proposed that instead of scattering the operators among nine or ten buildings in Washington, and in some cases having the work done away from the city, there should be a special administration building provided. For the preliminary work it was estimated that from 2800 to 3000 clerks, messengers, and other employees would be required. The director gives the following account of some of the striking features and new processes of the work which will be done in the census building in Washington: "The large space in the single-story part of the building has been divided into two separate rooms; each of these rooms will hold about 1000 clerks. Between these two rooms will be the fire-proof vault above referred to, and also a room for storing the cards which are to be used in connection with the tabulating machine. There will be about 100,000,000 of these cards. It is proposed to employ about 1000 clerks in transferring data from enumerators' sheets to cards about three by six inches in size. This is done by first preparing a card for each person enumerated, showing all the characteristics of such person. The cards used for this purpose are printed with letters and symbols so arranged that by punching holes in the proper spaces we get the following information regarding each individual: Race, sex, color, age, conjugal condition, birthplace of person, of father, mother, years in the United States, occupation, school attendance, etc. These cards, though only 7-1000ths of an inch in thickness, would form a stack, if piled one on another, about nine miles high, and they will weigh about two hundred tons.

"This transcript from the original returns of the enumerator to the punched card will be done with small machines, something like typewriters, called keyboard punchers. About 1000 of these will be used, and the entire work of transcribing the 75,000,000 or more individual records will be done in about one hundred working days, or nearly four months.

"These punched record cards are then counted, or tabulated, in the electrical tabulating machines. These machines are provided with a circuit-closing device, into which the cards are rapidly fed, one by one. The holes in the card control the electric circuits through a number of counters, which will, as desired, count the simple facts as to the number of males, females, etc., or the most complicated combination which the statistician may ask for. After the cards for a given district are thus passed through the tabulating machine, we know the number of native-born white males of voting age, the number of white children under five years of age born in this country with both parents native-born, or the number of such children with one or both parents foreign-born, or any other information contained in the enumerators' sheet which the statistician desires tabulated. In short, it is only necessary for the statistician to decide upon the information wanted, and for the electrician to make the proper connection from the counters and relays to the circuit-controlling device into which the cards are fed. The methods employed for checking the proper workings of the machines are ingenious and interesting. If the card is not completely punched, or not properly fed to the machine, or is placed upside down, or if some item has been overlooked, or, in fact, if everything is not all right, the machine refuses to work, and the card is rejected. Neither will the machine work if the circuit-controlling device is operated without a card in place. Such a machine also has the advantage that it will not make mistakes because it is tired or does not feel well, or because the weather is warm, or by reason of the thousand and one causes which will upset the human machine."

After the four chief subjects above mentioned have been completed and published under the title of Census Reports the statistics upon a great variety of special

subjects will be gathered. Among these especial subjects are the following: The insane, feeble-minded, deaf, dumb, and blind; crimes, pauperism, and benevolence; social statistics of cities; public indebtedness, valuation, and expenditure; electric light and power, telephone and telegraph business, transportation by water, express business, and street railway, and mines and mining. The title of these reports when published will be Special Census Reports.

The Law of 1899.—The main points of difference between the law of 1899 and that establishing the Eleventh Census have been summarized above, but the following more detailed account of these differences may be of interest. In the first place the law of 1899 defines the scope of the census somewhat differently from that of 1889. The latter called it a census "of the population, wealth, and industry of the United States," while the former termed it a census "of the population, of deaths, and of the manufacturing, mechanical, and agricultural products of the United States." The law of 1899 further established several new officers. Among others was the assistant director of the census above mentioned and the five chief statisticians, "who will be persons of known and tried experience in statistical work, at an annual salary of \$3000 each." In the matter of examinations the earlier act merely stated that all examinations for appointment and promotion should be in the discretion and under the direction of the secretary of the interior, while the act of 1899 provided that the chief clerk, the chief statistician, and the other employees below the assistant director of the census should be appointed by the director of the census, subject to such examination as he might prescribe, provided, however, that no examination should be required in the case of the enumerators or special agents, or of employees below the grade of skilled laborers at \$600 a year. The act of 1889 provided that the same schedules of inquiries should be used in the Eleventh Census as in the Tenth Census, subject to such modifications as might be approved by the secretary of the interior. The law of 1899 defined the schedule of inquiries and strictly limited their scope. In section seven it stated that "the Twelfth Census shall be restricted to inquiries relating to the population, to mortality, to the products of agriculture, and of manufacturing and mechanical establishments." The inquiries in regard to population for the Twelfth Census comprise the following points for each inhabitant: name, age, color, sex, conjugal condition, birthplace, birthplace of parents, whether alien or naturalized, number of years in the United States, occupation, months unemployed, literacy, school attendance, and ownership of farms or homes. The inquiries in regard to mortality comprised the name, sex, color, age, conjugal condition, birthplace, birthplace of parents, occupation, cause and date of death, and date of birth in the case of children born within the census year. Inquiries relating to agriculture comprise name of occupant of each farm, color, tenure, acreage, value of farm and improvements, acreage by products, quantity and value of products, number and value of live stock. Inquiries relating to manufactures comprise name and location of each establishment; character of organization, whether individual, co-operative, etc.; date of beginning operations; character of business or kind of goods manufactured; capital invested, number of proprietors, firm members, co-partners, or officers, and the amount of their salaries; number of employees and the amount of their wages; quantity and cost of materials used in manufactures; amount of miscellaneous expenses; quantity and value of products; time in operation during the census year; character and quantity of power used, and character and number of machines employed. The law of 1889 included a large number of subjects on which volumes should be prepared and published. Among these subjects were social statistics, mining, valuation, and public indebtedness; railway, express, telegraph, insurance statistics, and several other matters. The law establishing the Twelfth Census provided that the census reports proper should comprise only subjects relating to population, mortality and vital statistics, the products of agriculture, and of manufacturing and mechanical establishments. This is the work of the census proper, and these reports are to be issued not later than the 1st of July, 1902. The preparation of the Special Census Reports is rightly deferred until after the completion of this regular work. The complete list of topics to be covered by the Special Census Reports is as follows: The insane, feeble-minded, deaf, dumb, and blind; crimes, pauperism, and benevolence, including prisoners, paupers, juvenile delinquents, and inmates of the benevolent and reformatory institutions; deaths and births in registration areas; social statistics of cities; public indebtedness, valuation, and expenditure; religious bodies; electric light and power, telephone and telegraph business; transportation by water, express business, and street railway; mines and mining and minerals, and the production and value thereof, including gold, in divisions of placer and vein, and silver mines and the number of men employed, and the average daily wage, average working time and aggregate earnings in the various branches. For these there is no limitation of time proposed, except in the case of mining and mineral statistics, which must be published on or before July 1, 1903.

Method and Scope.—The American Economic Association appointed a committee

in 1897 to report on the scope and method of the federal census. This committee presented its report in the annual meeting of the association on December 28, 1898, and a brief summary was given in the last YEAR BOOK. In March, 1899, the association published this report, together with many special papers dealing with the various departments of the census. Taken together these papers form a body of criticism and suggestions in regard to the census-taking that surpass in value anything that has been before published. Their general tone was favorable to the plans adopted for the taking of the Twelfth Census, although it was not expected that the defects of previous censuses would be entirely avoided. The main fault found with the present method of census-taking in the United States is based on the temporary nature of the system. The inadequate and provisional system which was sufficient for the comparatively simple purposes of the older censuses is continued. Down to 1850 census work consisted in a mere enumeration of the number of persons in each family, according to their color, sex, and age, with the addition from time to time of a few other details. A temporary arrangement for the census at the end of each decennial period was sufficient, but, since that date, the scope of the census has greatly extended, and has come to include a great variety of facts in regard to the individual, as well as scores of inquiries relating to such subjects as agriculture, mortality, schools, libraries, churches, newspapers, and wealth. The extension of the schedules of inquiry made it impossible to do the work by means of marshals and assistant marshals without some central organization, and since 1850 the census laws have provided for a superintendent and have created a temporary census office. Between 1860 and 1870 a clerk was retained in charge of the census records, and between 1870 and 1880 not only the chief clerk but the superintendent was retained, the latter serving without pay. The Tenth Census, that of 1880, was badly executed, owing to the resignation of the superintendent and the death of his successor. The work was still incomplete when the census office was abolished by law in 1885. A census division was established in its place, and a portion of the census force continued their work, which lasted very nearly until 1890. The work of the census of 1890 was less cyclopædic in scope, since it was more strictly statistical, and included less historical and technological matter, but it followed up nearly as many lines of inquiry, and its published reports were as voluminous. All through the history of census-taking in the United States the work has suffered from its fitful character and the inadequate length of time allowed by law for preparation. The census of 1900 will suffer from these defects. In some respects, however, it has an advantage over the preceding censuses. In the first place, it cannot cover the whole range of subjects, but must first dispose of the four chief topics above mentioned. In the second place, it may distribute the work on the remaining topics over the entire interval of ten years, if need be. The special work is not to be allowed to interfere with the preparation of the census reports proper. In the third place, there is a better organization, since the director has been enabled to secure the services of an assistant director and of the five chief statisticians. It is thought that this will lighten his preliminary duties, and enable him to secure expert assistants in the subordinate offices. Fourthly, the reduction of the subjects to be investigated by the enumerators is thought to be a great advantage. At the Eleventh Census, that of 1890, it is said that the inquiries to which the enumerators were required to obtain answers numbered nearly 700. The work of the enumerators will be lightened not only in this way, but by calling in expert and special agents to collect the kind of data which cannot well be obtained in the ordinary house-to-house canvass. Another gain is expected to result from the provision for 300 supervisors in 1900. There were only 150 supervisors at the census of 1880 and 175 at that of 1890. The effect of this will be to reduce the districts in which the supervisors will have charge to manageable limits. The director also may, if he see fit, assign the work of enumeration to resident supervisors especially appointed for that purpose. As to the number of enumeration districts, it has been estimated by the director of the census that there will be about 50,000. This would give a much smaller average for the districts than was the case in preceding censuses, with the result of more accurate knowledge and a quicker completion of the work. The law of 1899 gives the director the discretionary power as to the number and form of the necessary inquiries. He will thus be able to limit the scope of the inquiries in order to insure the return of the data within the period fixed by law. It is thought to be more advantageous to limit the number of topics upon which information is sought for than to attempt to secure answers to a great variety of inquiries for which the time allowed is inadequate. As soon as the results of the account are received at Washington the work of tabulation will begin. A vast army of clerks is necessary for this purpose, and as a result of the temporary nature of the system these assistants must be organized and trained, since very few will have had any experience in this specific work of census-taking. At the census of 1890 the civil service rules applied to the clerical force of the executive department, but the census clerks and other employees were excluded. Their examination was in

the hands of the secretary of the interior, who appointed a board of examiners for the purpose. Clerical appointments for the census of 1900 are made upon a somewhat similar system, but the law provides that if an examination is prescribed it shall relate only to the fitness of the applicant for the particular duties of the office for which he seeks appointment. The argument for the exclusion of this class of candidates from civil service rules is that the work, being of a special and temporary nature, the eligible lists of the civil service commission would not supply the necessary force. Again, it has been stated that a fairly good test was applied to the applicants for work on the census of 1890. Apart from the objections urged by civil service reformers against the exclusion of the appointees from civil service rules, there is the further complaint that the method established by the law of 1899 entails much unnecessary personal work on the part of the director. The advantage which has been claimed for the new census law is that the director will have better means of securing the services of expert statisticians. To sum up the criticism that has been made upon the Twelfth Census: the chief defects are, as in previous censuses, the lack of time for preparation and the lack of a trained force of employees. It has been repeatedly said that to these two general causes almost all the serious defects of previous censuses can be traced. On the other hand, the Twelfth Census marks an advance over the previous censuses in the points briefly outlined above.

The Enumeration.—The selection of the enumerators for the 50,000 enumeration districts into which the country has been divided is made only after the applicant has shown his ability to fill out the blank schedule properly from the facts which he ascertained from the answers of the person questioned. It is expected that a higher grade of ability for enumerators will be secured than in the 1890 census. The work of enumeration is simplified by the fact that no enumerator will have to carry more than four schedules, whereas in the previous census he had to carry and understand from ten to thirteen. The questions asked are practically identical with those of the last two censuses, but the following questions, which were asked in 1890, have been omitted: "(1) Whether a soldier, sailor, or marine during the Civil War (United States or Confederate), or widow of such person. (2) Whether suffering from acute or chronic disease, with name of disease and length of time afflicted. (3) Whether defective in mind, sight, hearing, or speech, or whether crippled, maimed, or deformed, with name of defect. (4) Whether a prisoner, convict, homeless child, or pauper." One difficulty in the way of securing accuracy has been the fact that in the large cities many persons are away during the month of June, in which the census is required by law to be taken. The present system provides that any city enumerator shall report the houses which he finds closed on his rounds and the work of ascertaining the facts in regard to the residents of such vacant houses shall be assigned to a special enumerator, who shall discharge this duty by visiting the place of business or by correspondence.

CENTRAL AMERICA. See articles on the several countries.

CENTRAL ASIA. See ASIA; AFGHANISTAN; TIBET.

CEERAM, one of the largest of the Molucca Islands, lies to the west of New Guinea, and has an area of about 7015 square miles and an estimated population of 100,000. On the night of November 2, 1899, the island suffered a terrific earthquake, which moved from north to south, and was probably one of the series of seismic disturbances that occurred about the same time on the Japanese coast and adjacent islands. The shock induced a tidal wave, which rushed up the bay of Ambonia and stood some fifty feet over the lowlands. For miles the conformation of the coast was changed and the inland topography was greatly altered. Five thousand persons were known to have perished, and it is likely that the number was much larger.

CEYLON is a large island and British colony in the Indian Ocean, to the south-east of the peninsula of Hindoostan. Between it and the peninsula lie the Gulf of Manaar and Palk's Strait, but the chain of reefs known as Adam's Bridge almost spans these waters. It has an area of 25,365 square miles and a population estimated in the middle of 1897 at 3,391,443, of whom 6545 were Europeans, 23,663 descendants of Europeans, while the most numerous element of the natives were the Singhalese, who numbered 2,174,200. Other tribes are the Tamil immigrants and settlers, numbering 960,745; the Moormen—that is, the non-Malay Mohammedans, numbering 205,588—and Malays, Veddahs, and other races. A large part of the island is under cultivation, the largest acreage being under cocoanut trees, the next under rice and other grains, and some 404,000 acres being under tea. These crops, together with coffee, cinnamon, tobacco, cinchona, etc., are the main products. Among the minerals, plumbago is important. Pearl-diving was formerly a very productive industry, yielding in 1891, 960,000 rupees, but since that date it has been of no importance. The chief exports are tea, cocoanut products, plumbago, coffee, areca nuts, and cinchona; and the chief imports are cotton goods, salt fish, rice and other



JOSEPH CHAMBERLAIN.

grain, coal and coke, wines, spirits, etc. In 1897 the revenue was 24,006,522 rupees; expenditure, 21,634,378 rupees. The chief items of revenue are customs, licenses, sale of government timber and salt, stamps, receipts from the government railway, etc. The railway mileage in 1897 was 1217. The lines pass through very uneven country, which varies from sea level at Colombo to an altitude of 6300 feet near Nanwoya. The executive is vested in a governor and a council of five members, and the legislative in a council of seventeen members. The religion of the majority of the inhabitants is Buddhism, which is the faith of the Singhalese. Next to these in point of numbers are the Hindoos, and next the Christians and Mohammedans. The governor in 1899 was the Right Hon. Sir Joseph West Ridgeway, who was appointed in 1895.

CHAFFEE, ADNA ROMANZA, major-general United States volunteers, who was stationed in Havana early in 1899, was born in Orwell, O., April 14, 1842. He was educated in the public schools, and in 1861 entered the army, serving as a private and sergeant until he was made second lieutenant of the Sixth Cavalry. He became first lieutenant in 1865, captain in 1867, major Ninth Cavalry in 1888, and lieutenant-colonel Third Cavalry in 1897. He was brevetted first lieutenant in 1863 for gallantry at Gettysburg; captain for gallantry at Dinwiddie Court House, Va., in 1865; major in 1868 for gallantry while serving against the Comanche Indians in Texas, and lieutenant-colonel for gallantry against the Indians in Texas and Arizona in 1898. In that year he was appointed brigadier-general of United States volunteers, and served in the Santiago campaign. In July of that year he was made major-general of volunteers.

CHAMBERLAIN, JOSEPH, English secretary of state for the colonies, was prominent in 1899 by reason of his treatment of the difficulties arising with the South African Republic. He was born in London in July, 1836; was educated at University College, London, and entered his father's manufacturing business in Birmingham. Three times he was elected mayor of this city, and in 1876 represented it in Parliament. He is a Liberal Unionist. He sat for Birmingham until 1885 and thereafter for Birmingham West. From 1880 to 1885 he was president of the board of trade, with cabinet rank; after the election of 1885 he held the office of president of the local government board until his divergence of views on Gladstone's Irish policy brought about his resignation, March 27, 1886. He has been very active in politics, and on the formation of the coalition ministry in June, 1895, he became colonial secretary under Lord Salisbury. As a cabinet officer he has shown much energy and has endeavored to bring about closer commercial relations between Great Britain and the colonies. In 1897 he was to no small extent instrumental in effecting the passage through the Commons of the Workingmen's Compensation Act. For several years his colonial policy has been so vigorous that more moderate statesmen have called him a "jingo." In 1898 he declared himself in favor of an alliance with the United States. Mr. Chamberlain was censured in many quarters in 1899 for what some alleged was a persistently harassing and an unnecessary policy toward the South African Republic. For an account of his negotiations with President Kruger, see TRANSVAAL (paragraphs on History).

CHAPELLE, PLACIDE LOUIS, Roman Catholic archbishop and apostolic delegate to the Roman Catholic Church in Cuba and Puerto Rico, was born in France, August 28, 1842. In 1859 he came to this country and studied theology and philosophy in St. Mary's College. In 1865 he was ordained priest, and engaged in missionary work. He became pastor of St. John's and St. Joseph's Church in Baltimore and of St. Matthew's in Washington, and presided over important theological conferences in those cities. He was made an archbishop in 1893, and in 1894 became archbishop of Santa Fé, and in 1897 archbishop of New Orleans. The Pope appointed him apostolic delegate to Cuba and Puerto Rico in 1898, and he entered upon his new mission in January, 1899.

CHARITIES. *Outdoor Relief.*—There was much discussion in the year 1899 of the problems connected with outdoor relief. An examination of the duty of the municipal governments of the forty largest cities in the United States was made by Mr. Frederick Almy, and the results were published in the *Charities Review* for March and April, 1899. The extent of the public and private outdoor relief in these cities and the ratio of one to the other are illustrated by this writer in the following table:

PUBLIC AND PRIVATE OUTDOOR RELIEF IN THE UNITED STATES.

	Popula- tion. (1898.)	Public outdoor relief. (1897.)	Private outdoor relief.	Public out- door relief. Per capita.	Private out- door relief. Per capita.	Total out- door relief. Per capita.
New York	2,000,000	None	\$328,666	\$0.00	\$0.164	\$0.164
Chicago	1,800,000	\$126,300	100,000	.08	.055	.135
Philadelphia	1,250,000	None	38,121	.00	.030	.030
Brooklyn	1,180,000	None	51,655	.00	.044	.044
St. Louis	650,000	Trifling	69,478	.01	.107	.117
Baltimore	625,270	None	40,272	.00	.064	.064
Boston	550,000	69,667	130,534	.13	.240	.370
Cincinnati	400,000	5,520	10,463	.01	.026	.036
Buffalo	389,000	106,920	12,950	.28	.033	.313
Cleveland	385,000	32,128	2,546	.08	.007	.067
San Francisco	350,000	None	49,000	.00	.140	.140
Detroit	320,000	(1896) 50,545	625	.16	.002	.162
New Orleans	300,000	Trifling	2,500	.01	.008	.018
Pittsburgh	290,000	15,323	19,077	.05	.065	.115
Washington	280,000	(1898) None	10,000	.00	.036	.036
Milwaukee	275,000	(1898) 50,227	7,900	.18	.029	.209
Newark	250,000	20,792	14,305	.08	.057	.141
Louisville	215,000	Coal only	2,479	.01	.012	.022
Minneapolis	210,000	23,528	None	.11	.000	.110
Jersey City	200,000	6,000	2,368	.03	.012	.042
Kansas City	200,000	None	13,404	.00	.067	.067
Indianapolis	185,000	7,185	8,061	.04	.044	.084
Rochester	175,000	49,023	7,402	.28	.042	.322
Denver	170,000	None	4,744	.00	.028	.028
St. Paul	160,000	9,695	3,850	.06	.024	.064
Providence	154,000	7,927	9,240	.05	.060	.110
Omaha	150,000	19,514	6,191	.13	.041	.171
Toledo	135,000	31,291	None	.23	.000	.230
Syracuse	133,000	45,092	144	.34	.000	.340
Columbus	130,000	21,896	None	.17	.000	.170
Allegheny	125,000	9,068	4,150	.07	.030	.100
Atlanta	118,000	None	4,000	.00	.034	.034
New Haven	112,000	9,069	3,710	.09	.033	.123
Scranton	110,000	14,850	None	.13	.000	.130
Memphis	109,914	None	?	.00	?	?
Worcester	105,000	5,807	1,229	.06	.012	.072
Fall River	104,000	24,828	None	.24	.000	.240
Albany	100,000	7,430	3,100	.07	.031	.101
Richmond	100,000	4,595	None	.05	.000	.050
Grand Rapids	100,000	13,640	575	.14	.005	.145
Cambridge	87,000	4,770	12,733	.05	.150	.200

The figures for private outdoor relief are necessarily inexact, since it was found impossible to obtain exhaustive and precise returns. It appears from these tables that ten of these larger cities give no public outdoor relief; that where they give little or no public outdoor relief this deficiency is in almost all cases supplemented by private relief, and that in almost all cases where private relief is not given an increased burden rests upon the government. So the general result of the examination was to bear out what had been formerly supposed—namely, that a city which gave no public outdoor relief must give a considerable amount of private outdoor relief, and that, *vice versa*, where there is no private relief public relief must take its place. The question whether liberal public relief tends to check private charity also receives an answer from these figures. Where the public outdoor relief is liberal the private relief is not, and, *vice versa*, wherever cities give liberally for private outdoor relief there is not liberal public outdoor relief. Thus, a balance between the two appears to be established. The per capita amount necessary for outdoor relief varies greatly in the different cities, as appears from the table. The important point here is whether the per capita amount increases as one or the other of the systems prevails. The conclusion of the writer is that the average per capita rate of the cities which depend wholly upon private relief is 6¾ cents, and of those which depend wholly upon public relief is 17½ cents. He finds from the study of the statistics of Buffalo and Boston, where charity organization societies have been long established, but where public outdoor relief is also given lavishly, that the investigations are not prudently conducted and that the expenditure is excessive. The general result of the examination was that the abolition of public outdoor relief is desirable, but that a private general relief society must be established to take its place.

State Legislation, 1899.—The chief legislation adopted in the States during the year on the subject of charities and correction in general may be summarized as follows: In Indiana a new law provides for the appointment of a board of charities and correction by the circuit court on petition of fifteen citizens, this board to visit

and inspect all the charitable and correctional institutions of the State and to report thereon to the county commissioners and State Board of Charities. In New Hampshire the legislative act authorizes the governor and council to appoint three commissioners to consider the subject of "State support and control of the dependent, insane, and feeble-minded, and methods for moral improvement in the penal institutions of the State." In New York the State comptroller and the president of the State Board of Charities have been authorized to classify and fix the salaries of officers and employees of charitable and reformatory institutions. In Wisconsin the State Board of Control has been directed to inspect semiannually the sanitary condition of the county asylums, poorhouses, and jails. A Texas law establishes the office of purchasing agent for charitable institutions. On the specific subject of poor relief an Indiana law directs the overseers of the poor to co-operate with private organizations and keep informed concerning their work, in order to prevent the unnecessary duplication of relief and the giving of misguided and useless alms. In Arkansas the practice of letting out paupers to the lowest bidder who gives bond to provide them with shelter, food, and medical attendance has been authorized by law. In Arizona the supervisors of the poor are permitted by law to contract with other counties for the care of the county poor, and in Minnesota a law permits the establishment of district poorhouses in two or more counties of a joint population of 25,000. The two last enactments were based on the view that better facilities and a more fitting classification of paupers could be obtained by the consolidation of county poorhouses. In the matter of dependent and neglected children, general laws in Illinois, West Virginia, Washington, and Wyoming practically recognize the duty of the State to interfere. In New Jersey a law creates a State board of children's guardians, to have the oversight of all dependent children.

Epileptics.—The recent movement to give the State the especial charge of the care and treatment of epileptics made considerable progress in 1899. The first State to act upon this principle was Ohio, which opened an asylum for epileptics in 1893. This practice was followed by the governments of Massachusetts, California, and New Jersey. In New York the Craig colony for epileptics was established in 1894. In 1899 epileptic colonies were established in Illinois and Missouri. Texas established an asylum for epileptics, and in North Dakota the way was opened for State interference in this matter by the reference to the next legislature of a constitutional amendment for the formation of an institution for the feeble-minded. Figures showing the status of these epileptic colonies during the year were not available, but the following facts show the recent progress at the Craig colony in New York. The 322 colonists in the institution on October 1, 1898, were increased during the succeeding year by 95 new cases, while during the same period 39 were discharged and died or were transferred to other institutions. The number in the colony on October 1, 1899, was 378. The death rate during the year was less than two per cent. An improvement in a large number of cases was reported in 1899, in spite of the fact that epilepsy is so infrequently cured. Even where cures were not absolutely effected there was a marked reduction in the number and violence of seizures and a great improvement in physical condition. It was further reported that the colonists were becoming more useful factors in the work of the colony, and that the idea of colony life was gaining ground. A group of eleven buildings were completed in the course of the year. The educational work was conducted with good results. It included kindergarten work, a night school, nature study, manual training, Sloyd instruction, and industrial and trade schools.

Charity Organization.—The object of charity organization is to secure co-operation on the part of existing charitable institutions. Charity organization societies are federations composed of representatives of the various charitable bodies. They have been formed in nearly a hundred cities in the United States. The chief purposes of these federations have been classified as follows: First, co-operation; second, the gaining of adequate knowledge; and third, the enlistment of personal volunteer service. The advantage of co-operation in preventing duplication of work and in promoting the efficiency of charitable relief is at once obvious. It provides for the interchange of information, and the importance of this in some of our large cities may be inferred from the fact that in New York City 531 co-operating societies and churches exchange information through the registration bureau of the New York Charity Organization Society. As to the obtaining of adequate knowledge, the systematic methods rendered possible by charity organization promote economy and bring better results. They lessen the opportunities for fraud and they enable the societies to ascertain more fully the nature of the relief needed and the best means of affording it. The element of personal service is considered the most important part of charity organization work. It directs philanthropy into safe channels. It prevents the kind of harm that well-meaning persons often do by giving undeserved alms. At the same time it retains the benefit of friendly visiting and of contact between the well-to-do and the poor. The friendly visitors under the charity organization system are not allowed to give alms. The question of affording that sort of re-

lief is decided at headquarters. The principle of charity organization is the well-established one that the poor should be helped to help themselves, and its main work is to find employment for deserving applicants, and if this is impossible to employ them in its own labor yards and work rooms at a low rate of wages. In all cases it seeks to apply a labor test. Charity organization societies are not associations for the purpose of giving relief in the form of alms. There are cases of distress in which they do give alms, but their real purpose is to find the cause of indigence and to remove it. They are strongly opposed to any form of indiscriminate almsgiving, which they consider worse than a waste of money, since it lowers the moral character of the poor. They deny the principle that it is better to give to nine unworthy applicants than to pass by one deserving case. As to the granting of outdoor relief by public agencies, the charity organization workers hold that it is a wasteful policy on the ground that it increases the number of applicants, calls for an impossible degree of discrimination and results in lowering wages. Some American cities have done away with public outdoor relief. Brooklyn, for example, abolished it in 1878, and the efficient work of the Charity Organization Society, which was founded in that year, seems to have more than offset the absence of this form of relief. The case of Philadelphia, which abolished its public outdoor relief in 1879, after the Charity Organization Society was founded there, is cited as another instance of the economy and efficiency of the new system. It is the opinion of prominent writers on charity in the United States that outdoor relief "educates more persons for the almshouse than it keeps out of it." A recent writer points out the attitude of the economists toward charity organization. The chief features of the economic discussion on this point may be briefly outlined as follows: The classical school of English economists, with their faith in the doctrine of *laissez-faire*, found no place in their philosophy for altruistic motives, although some of them, like Malthus, advocated a form of voluntary and active charity which would tend to unite the rich with the poor, and John Stuart Mill drew attention to the fact "that energy and self-dependence are liable to be impaired by the absence of help as well as by its excess." Malthus favored private charity in preference to state relief, while Mill held the opposite opinion. There was little consistency among the members of the old school, and a good many of them made no attempt to define the relations of charity to economic science. The later economists in their wider view of the scope of their science have recognized the principles of charitable work as a fit subject for economic inquiry, and this subject now forms a part of almost every systematic treatise on economics. At the present time economic opinion is divided upon the questions of charitable relief, but the limited views of the old-school doctrine are no longer widely held. Some of the economists in England have opposed the idea of the charity organization societies that public outdoor relief is injurious, and they hold that while this practice would have been detrimental in earlier times, it is capable of beneficial results under the improved modern conditions. Thus these economists carry their ideas of the scope of charities farther than do many of the practical philanthropists. On the other hand, there are still exponents of the *laissez-faire* theory. Of these the most famous example is Herbert Spencer, who holds that the relief of the poor at the public expense is unethical and that organized voluntary charity is nearly as bad. He would dispense with charitable institutions and rely solely on personal giving—that is, on the relief which a man might feel it his duty to afford to persons with whom he came in immediate contact. His general attitude is that charity checks material progress, and he says it is hard to see how assistance to the poor can prevent "the inferior from begetting more of the inferior." His one argument for charity seems to be the effect upon the giver and not upon the recipient. It may make for progress, according to him, on account of its effect upon the emotional and æsthetic side of man's nature. In other words, this is the view that charity, while economically bad, may yet be ethically desirable. Others who also belong to the minority argue that a charity which is economically injurious is ethically wrong, and claim that the unwise sympathy, which does not take account of harmful results, cannot be ethically justified. Others again argue that any charity which is demanded by a sound ethical sentiment is justified whatever be its effect upon material progress. In general, philanthropy has become more scientific on the one hand, and economics have paid more attention to philanthropy on the other hand. The ethical basis of charity is not denied by most writers of the present day, nor are the economic effects taken as the sole criterion. It is not disputed that even those charities of the past which were least defensible on economic grounds may have furthered the progress of civilization by educating men in altruism. At the same time the wider and more systematic knowledge of charities to-day do not justify the repetition of those mistakes. The good intention does not prevent the harm. Practical duties will change with advancing knowledge of social laws. Charity organization attempts to afford a scientific outlet for the ethical impulse.

CHARITY ORGANIZATION SOCIETY, organized 1882 for the purpose of

improving the condition of the poor by the systematic investigation of cases of distress. The New York City society spends no money in almsgiving, none of its funds being used for relief, but only for the directing of needy persons to places where they may obtain it. This society, in the year ending June, 1899, reports 12,894 cases recorded; receipts, \$54,327. President, Robert W. De Forest; secretary, Edward T. Devine, 105 East Twenty-second Street, New York City. The organ of this society is *Charities*, and an annual *Directory of Charities* of New York City is published. There are 112 charity organization societies in various cities of the United States. See CHARITIES.

CHAUDORDY, JEAN BAPTISTE ALEXANDRE DAMAZE, COMTE DE, French diplomat, died March 26, 1899. He was born December 4, 1826, and entered the diplomatic service in 1851 as attaché of the French embassy at Rome, of which he became five years later the secretary. During the next six years he held a similar position successively at Weimar, Madrid, Copenhagen, and Carlsruhe. In 1862 he was made under-secretary in the French cabinet, and was appointed minister to Spain in 1868. As a representative of the French foreign office he published in 1871 a series of circulars, addressed to the powers, refuting accusations made by Bismarck that France had violated the terms of the Geneva convention. After the Franco-Prussian war he served two years in the Chamber of Deputies as a representative of Lot-et-Garonne, when he was appointed ambassador to Switzerland, from which post he was transferred less than a year later to Madrid. In 1876 he became a commander of the Legion of Honor. Among his writings are: *The Political Status of the French Nation; France Following the War of 1870-71; France in 1880*.

CHAUTAUQUA SYSTEM OF EDUCATION, originated in 1874, is composed of the Chautauqua Assembly, holding annual meetings in July and August at Chautauqua, N. Y., at which sessions courses of instruction are given in various branches of learning, together with lectures, recitals, concerts, etc.; and the Chautauqua Literary and Scientific Circle, which has enrolled, up to 1899, more than 250,000 members. The latter is designed to give local opportunities for study by the formation of circles pursuing a four years' course of study prescribed by the directors of the Assembly. President, Clem. Studebaker, South Bend, Ill.; secretary, W. A. Duncan, Syracuse, N. Y. The number of students in the summer school in 1899 was 2262. Principal of instruction, Dr. George E. Vincent, 5737 Lexington Avenue, Chicago, Ill. The publications are: *The Chautauquan*, Chautauqua Literary and Scientific Circle books, and the *Chautauqua Assembly Daily Herald*. Meeting for 1900 at Chautauqua, June 27 to August 24.

CHEMICAL SOCIETY, AMERICAN, organized 1876, in 1899 had 1569 members. Secretary, Albert C. Hale, Ph.D., 551 Putnam Avenue, Brooklyn, N. Y. City.

CHEMISTRY. The wonderful progress made in the study of science during the century so soon to close was ably discussed in the presidential address of Sir Michael Foster at the meeting of the British Association, held in Dover in September, 1899. He contrasted in bold outlines the status of the science of chemistry in 1799 and in 1899, saying: "We have only to read the scientific literature of the time to recognize that a truth which is now not only woven as a master thread into all our scientific conceptions, but even enters largely into the every-day talk and thoughts of educated people, was a hundred years ago struggling into existence among the philosophers themselves. It was all but absolutely unknown to the large world outside those select few." Chemistry is essentially a science of the nineteenth century, and the activity in it is not excelled by any other branch of learning. It is taught in every college and university in the country; it is practised in connection with every important industry; and there are chemical laboratories connected with every State experiment station, with every board of health, and in many municipalities. It is becoming more and more rare that a striking discovery is made in chemistry; progress is continual and persistent, but it is rather a development of a closer study of details. Methods of analysis are being improved both as regards accuracy and rapidity; this leads to a more precise knowledge of the composition of things. In organic chemistry gaps in well-known series of compounds are being filled, and in technology processes are continually modified in accordance with the most recent information. As an illustration of the ramifications in industrial chemistry may be cited the classes into which that branch has been subdivided for the Congress to be held in Paris in 1900: 1. Analytical chemistry; 2. Inorganic products; 3. Metallurgy, mines, explosives; 4. Organic products; 5. Sugar industry; 6. Fermentations; 7. Agricultural chemistry, fertilizers, cattle feeding, dairy; 8. Hygiene, medical, and pharmaceutical chemistry; 9. Photography; and, 10. Electro-chemistry. These facts are cited to show the practical impossibility of any adequate review of the details of the progress in chemistry as a whole for a year.

American Chemical Society.—In this country the largest body of chemists is the American Chemical Society (*q. v.*), with 1569 members. It held two meetings dur-

ing 1899, one at Columbus, O., contemporaneous with the American Association for the Advancement of Science, when nine papers were read and discussed. The address of Frank P. Venable before the section of chemistry of the American Association attracted some attention. It was an able review of our knowledge of the constitution of matter. He pointed out the increasing number of fallacies in the atomic theory, and presented the growing arguments in favor of the theory that elements are only varieties of one original kind of matter; thus raising the question as to whether it was not time seriously to reconsider certain of the fundamental beliefs of chemists. A second meeting was held in New Haven, Conn., during December 27-28, at which twenty-one papers were presented.

Theoretical Chemistry.—Among the announcements made in theoretical chemistry in the year 1899 may be mentioned the startling communication presented before the British Association by J. J. Thompson, in which he discussed the existence of masses smaller than atoms. He finds that the charge carried by an atom in cathode discharges and similar phenomena is apparently one thousand times greater than in ordinary electrolysis; consequently either the atoms become disassociated and only a portion of their mass carries the negative charges of cathode rays, or else the atom can receive a greater charge than is assigned to it in explaining electrolytic phenomena. The division of the spectra of certain elements in series of lines would tend to suppose a belief in the complex nature of elements. There is a continued activity in the extension of the limits of temperature. Dewar in his experiments with liquid hydrogen has reached the point of 21° C. above absolute zero, a degree of cold which has four times the frigorific potency of liquid air. Liquid hydrogen is a limpid fluid, clear as water, but possessing only one-fourteenth as much specific gravity. Air freezes and sinks into it, and a cork sinks in it as lead does in water. Dewar's experiment confirms the existence of helium and neon, but fails to corroborate the existence of metargon, xenon, and krypton. It is believed that 20° C. is the lowest temperature that it is possible to reach by present methods. Turning to high temperatures, Moissan continues his researches, using the electric furnace of his own invention. A temperature of 3500° C. has been obtained by him, and during the year he has devoted much attention to calcium compounds. More recently he has returned to the electrolytic preparation of fluorine, an element which was known only in combination until isolated by him. The production of silicon, both in its crystalline and graphitoidal form, is reported by Hyde and by De Chalmot, both of whom obtained their results by using the electric furnace.

New Elements.—Of these, no very remarkable announcements can be made; victorium is the only one discovered during the year. It was obtained by Crookes from the earths of the cerium group. It is described as a pale, brown-colored earth, easily soluble in acids and less basic than yttria. Assuming its oxide to have the formula V_2O_3 , the atomic weight will be about 117. It was named in honor of Queen Victoria. Nasini and his associates, in making a spectroscopic examination of the solfatara of Pozzuoli and Vesuvius, claim to find the spectra of argon, coronium, and other elements. The existence of certain unknown lines lead them to suspect the presence of new gaseous elements. Further announcements of unknown bodies have been made in Paris as having been obtained in examining complex minerals by means of the Becquerel rays. The place of the new constituents of the atmosphere in the periodic system proposed by Mendeleeff continues an undecided question, and Howe argues that they are to be considered the first elements of the eighth group in Mendeleeff's table.

Atomic Weights.—There has been continued activity in the redetermining of the atomic weights of the elements, and during the year revisions have been published as follows: Boron, 11.016; nitrogen, 14.031; nickel, 58.709; cobalt, 58.998; molybdenum, 96.069; palladium, 107.014; and cerium, 138.81.

Inorganic Chemistry.—In this branch of chemical science progress has been steady, and perhaps the most promising announcement is that made by F. W. Clarke, who, in studying the action of ammonium chloride upon silicates, has obtained some new compounds of an unusual character. He finds that analcite or leucite heated to 350° C. with ammonium chloride in a sealed tube yields ammonium leucite, which is perfectly stable at 300° C. All the zeolites yield similar derivations; so that it is now possible to replace fixed alkalies by ammonium in many silicates and to get compounds capable of splitting up upon ignition in such manner as to shed light on their chemical constitution. Ammonium silicates have been hitherto unknown.

Physical Chemistry.—It has been said recently that "physical chemistry is the chemistry of the future," and in no branch of chemistry have greater advances been made in recent years. J. H. van't Hoff is the recognized leader in this specialty, and this chemist and the students under him have devoted much attention to the deposition of the soluble constituents of sea water during the year. Tammann is the author of some very important contributions on the limits of the solid state. He has discussed at considerable length the probable general form of the melting-point curve,

and reaches a conclusion that no gradual change from crystalline to liquid condition can occur, and hence that the general form is probably that of a closed curve. He further shows that there is no sudden change in the physical properties of a substance as it changes from a liquid to a solid state, unless the solid phase be crystalline; therefore he would restrict the term solid to crystalline substances alone, and regard amorphous solids as under-cooled liquids. Bodenstein has devoted considerable time to the study of the gaseous reactions in chemical kinetics. Duhem fails to agree with the last-named authority, and has himself studied the mathematical theory of equilibria in heterogeneous and homogeneous systems.

Organic Chemistry.—Organic chemistry is the subdivision which continues to receive the greatest attention from students, especially in the laboratories in German universities. Von Baeyer, to whom we owe the synthetical production of indigo, continues actively at work on the subject of orientation in the benzene ring, with special reference to the terpenes. Schiff is another worker in this same field, who also has devoted much attention to the same subject. The constitution of inorganic compounds is the general title of a series of elaborate investigations by Werner, Megerle, Pastor, and Spruck, whose most recent publication treats of compounds of ethylenediamine and propylenediamine with salt of bivalent metals. A. Fock has published an important paper on the crystallographic relations of optically active substances and their racemic compounds. He finds that optically active substances may be divided into three groups: First, those with no racemic compounds, the two antipodes crystallizing separately from the mixed solution; second, those in which the antipodes unite in constant proportions to form a racemic compound; and third, those in which the antipodes unite in varying proportions to form numerous racemic or pseudo-racemic compounds. A most important contribution has been the extended work by Elbs and Kopp on the electrolytic synthesis of organic compounds, and in this same field Edgar F. Smith, of the University of Pennsylvania, has been an active worker during recent years. By far the most striking contribution published during the year is the paper by Markownikoff on *Derivatives of the Naphthene or Cyclohexane Series*, in which he discusses general methods for the dilution of physical isomers in mixtures of the same. W. A. Noyes, of Terre Haute, Ind., has continued during the year his classic work on camphoric acid, and his published results have given him a high standing among American workers in organic chemistry.

Industrial Chemistry.—In the domain of industrial chemistry, or, as it is sometimes called, chemistry applied to the arts, there has been steady progress during the year, although it has been chiefly in the direction of increased production rather than of striking novelties. Perhaps the most important advance has been in the employment of electrical power for chemical and metallurgical processes, and nowhere has this progress been greater than in the United States. An estimate published in Germany, giving the value of possible products to be manufactured by electro-chemical processes, shows the figures for the United States to be \$97,500,000; the next is that of Germany, which is given as \$13,750,000, followed by France with \$11,250,000. The values of the individual products in the United States are as follows: Copper, \$56,250,000; silver, \$28,350,000; gold, \$4,900,000; calcium carbide, \$4,500,000, and aluminium, \$2,625,000. In regard to actual processes the continued application of the cyanide process for the extraction of gold is important, and in some of the improved methods yields of 90 per cent. are reported. The desilverization of lead by electrolysis continues to be improved, and excellent results are reported by the method introduced by Tomasi. In copper the use of the Herreshoff progressive and continuous roasting furnace is growing, and the extension of the Hoepfner method for the extraction of that metal is reported. Improvements in Mona's process for the extraction of nickel have been described during the year, and the process of Goldschmidt for obtaining high temperatures and the reduction of refractory metallic oxides by combustion of aluminium has been further developed. The total abolition of the vitriol chamber in the manufacture of sulphuric acid, patents for which were obtained by the Badische Anilin and Soda Fabrik during the year, is described by Lunge as "the greatest revolution which has taken place since that acid became a commercial product." The principal feature of this improvement is the discovery that it is necessary to get rid of the heat of the reaction in order to obtain a quantitative union of sulphur dioxide and oxygen forming sulphur trioxide, and that under such circumstances a complete union is obtained, even when using ordinary dilute technical gases, such as result from pyrite burners. The application of electrolytic methods to the production of chlorine and its compounds continues to increase, and seems to mark the passing of the Leblanc process for the manufacture of soda ash, as that important article is now so extensively produced by the ammonia-soda process. The increasing number of chemical industries that are locating in the vicinity of Buffalo, and taking their power from the Niagara River, is indicative of the development of such industries in this country, and show the wonderful growth in that direction that has occurred since the World's Fair, held in Chicago in 1893,

after which the foreign experts returned to their own countries to describe the great future in store for the United States. The application of electricity in the manufacture of white lead has resulted in a product which is obtained at a less cost and for which the claim is made that its properties are superior to those of the lead obtained by the conversion method. The process consists of volatilizing the lead in an electric furnace and then subjecting the vapor to the action of air and steam, carbon dioxide, and acetic acid. Active work continues in the production of artificial silk, and Chardonnet's process is now employed commercially. The preparation of the cellulose products of Cross and Bevan is carried on in England and Germany, yielding the products known as viscose and viscid, which are used for the sizing of paper and tissues with good results. Fuller details on the progress of industrial chemistry are to be found in George Lunge's *Impending Changes in the General Development of Industry, and particularly in the Alkali Industries*, *Journal of the Society of Chemical Industry*, for October, 1899; and in William McMurtrie's *Some Records of Progress in Applied Chemistry*, *Journal of the American Chemical Society*, December, 1899.

Physiological Chemistry.—In physiological chemistry the remarkable statement was published toward the close of the year that at Woods Hole the unfertilized eggs of the sea urchin, when subjected to a solution containing certain sodium and magnesium salts, became fecundated thereby, hatching the first larvæ thereafter. Further experiments seemed to show that only the presence of calcium and potassium salts in sea water prevented the development of all unfertilized eggs, and that all the milt deposited by the male needed to do was to overcome the effect of these chemicals. This may be a step in the progress which chemists are daily making toward the breaking down of the barrier which exists between that which is life and that which is not life. Also of special value has been the continued work by Buchner on the important question as to whether alcoholic fermentation could be obtained without cells. This was controverted by Abeles, but later experiments by Buchner sustained his original investigations. Among the more distinguished chemists who have passed away during the year may be mentioned Robert Wilhelm Bunsen, Hamilton Young Castner, Sir Edward Frankland, Auguste Scheurer-Kestner, and Ferdinand Tiemann.

CHENNEVIERES, Marquis CHARLES PHILIPPE DE, director of the *Académie des Beaux-Arts*, was born July 23, 1820; died April 2, 1899. He was a member of the Institute of France and was chairman of the board of administration of the Paris Exposition of 1878.

CHERBULIEZ, VICTOR, romancer, and member of the French Academy, was the son of André Cherbuliez, a professor of Latin in Geneva, and was born in that city July 19, 1829. He died July 1, 1899. In Geneva, Paris, Bonn, and Berlin he studied first mathematics and then philology and philosophy, being greatly influenced in the German universities by the writings of Hegel. He taught in his native city until 1864, when he accepted an editorial position on the Paris *Revue des Deux Mondes*. In this periodical appeared, with one or two exceptions, all of his works, comprising now about thirty volumes, of which twenty-four are novels. The appearance of *Un Cheval de Phidias* in 1861 marked the beginning of his literary career. He was then a man of mature years and of deep scholarship and wide reading in continental literature, whose mind had been further enriched by travels in Greece, Russia, and the East. Cherbuliez never became a popular writer in the sense that Zola and Daudet became popular, but to those to whom he appealed at all he appealed strongly. Though his plots are interesting and dramatic, it is other characteristics that have especially endeared his works to his admirers. These characteristics were a delicate humor, a rich imagination, a deep intellectual and philosophical culture, and a style that was pure, classic, and brilliant. "L'esprit" is truly the most general characteristic of the work and talent of Cherbuliez. It is a delicate, subtle, and fine irony which plays across every page, and is, above all, discernible in the dialogue of his heroes, in the author's reflections, and even in his style. "Though a skeptic in metaphysics, the philosophy which exhales from his works is neither frivolous nor immoral. He believed in toil, in justice, in goodness. His raillery was reserved for two kinds of men—knaves and fools. He preached incessantly resignation, sacrifice, mutual respect, and toleration." Over the pen name of Valbert he published monthly after 1875 essays on politics and a variety of other subjects. In 1881 he became a member of the French Academy. His works include: *Le Comte Kostia*, 1863; *Le Prince Vitale*, 1864; *Paule Méré*, 1865; *Le Roman d'une Honnête Femme*, 1866; *Le Grand Œuvre*, 1867; *Prosper Randocce*, 1868; *L'Aventure de Ladislas Bolski*, 1868; *L'Allemagne Politique*, 1870; *La Revanche de Joseph Noircl*, 1872; *Meta Holdenis*, 1873; *L'Espagne Politique*, 1874; *Miss Revel*, 1875; *Le Fiancé de Mlle. Saint-Maur*, 1876; *Samuel Brohl et Comp.*, 1877; *Hommes et Choses d'Allemagne*, 1877; *L'Idée de Jean Têteral*, 1878; *Amours Fragiles*, 1880; *Noirs et Rouges*,

1881; *La Ferme du Choquard*, 1883; *Hommes et Choses du Temps Présent*, 1883; *Olivier Maugant*, 1885; *La Bête*, 1887; *La Vocation du Comte Ghislain*, 1888; *Une gageure*, 1890. His last novel is *Jacquine Vanesse*.

CHESS. The year 1899 was a notable one for American chess. Pillsbury and Marshall won honors for the United States abroad, while the fourth annual international cable match was won from Great Britain by the Americans for the second time in the series, the Americans now holding the Newnes trophy. The year saw, also, the first international intercollegiate cable match. In this country there was a continuation of telegraphic and correspondence matches. There was organized in 1899 the Chess Association of the United States, and also many new State associations. The national organization established headquarters at 105 East Twenty-second Street, New York City, with the following officers: President, Judge Lesser, of Boston; secretary, George H. Walcott, of Boston; treasurer, W. P. Shipley, of Philadelphia. The marked growth in intercollegiate interest in the game was shown during 1899 in the newly established cable match, instituted by the Intercollegiate Chess Association, composed of Harvard, Yale, Princeton, and Columbia. In addition, the intercollegiate association was supplemented in 1899 by a second organization, known as the Tri-collegiate Chess Association, whose members are the universities of Pennsylvania, Cornell, and Brown. This association held its first meeting December 27-30. It was proposed by the latter body that the winners in the two respective tournaments next year meet one another in a third tournament. It was suggested, also, that the Tri-collegiate Association be allowed representation in the next intercollegiate cable match with the English universities. Early in the year the Polish champion Janowski visited New York, where he played with much success. Abroad occurred the great international tournament at London, the Russian national tournament at Moscow, and the international tournament at Amsterdam. Important records of the year follow: International tournament, May 30 to July 10, London, 16 entries: won by E. Losker, 22 out of 27; tied for second place, with 18 out of 27, H. N. Pillsbury, American champion, D. Janowski, Polish champion, and G. Maroczy, the three dividing the second, third, and fourth prizes. Minor London tourney, May 30 to June 15, 12 entries: won by F. J. Marshall, Brooklyn, N. Y. City. Fourth annual cable match, America vs. Great Britain, March 10-11: won by America, 6 games to 4, the American players being Pillsbury, Showalter, Barry, Hodges, Hymes, Voigt, Johnston, Marshall, Newman, and Baird. First international intercollegiate cable match, Intercollegiate Association vs. Cambridge and Oxford, April 21, 6 players a side: won by English universities, $3\frac{1}{2}$ to $2\frac{1}{2}$, trophy being a shield, valued at \$1100, presented by Professor Isaac L. Rice. Seventh annual intercollegiate tournament, Columbia, Harvard, Yale, and Princeton, December 26-30: won by Harvard, 10 victories, for fifth consecutive time, Columbia having won the first two tournaments of the series; second, Columbia, $8\frac{1}{2}$; third, Princeton, 3; fourth, Yale, $2\frac{1}{2}$. First annual tri-collegiate tournament, Pennsylvania, Cornell, Brown, December 27-30: won by Pennsylvania, 6; second, Cornell, $5\frac{1}{2}$; third, Brown, $1\frac{1}{2}$. The Moscow tournament was won by M. I. Tschigorin; at Amsterdam, H. E. Atkins, England, took first prize. The champion Janowski played two matches at New York with the American player Showalter, winning the first, 7 to 2, with 4 draws, and losing the second, 4 to 8, with 1 draw; he defeated Marshall, 3 to 1, and in a match against 15 New York experts he won 14 out of 15 games, and 1 drawn. The State associations held their annual tournaments on Washington's Birthday, which is the great day for chess in this country. The States were New York, Pennsylvania, New Jersey, Rhode Island, Ohio, Mississippi, Virginia, and others. New York also held a summer meeting at Saratoga, and later won the third New York-Pennsylvania match. New York City (Brooklyn) beat Chicago in a correspondence match, Chicago beat Boston in a telegraphic match, and New York (Manhattan) beat Philadelphia in a match held at the latter city; the Vienna chess club beat the St. Petersburg club in a two-game match by $1\frac{1}{2}$ to $\frac{1}{2}$, the most notable European club match. A correspondence match between the United States and Canada was arranged for in 1899.

CHICAGO DRAINAGE CANAL. See CANALS; SEWAGE PURIFICATION.

CHICAGO, ELECTION IN. See HARRISON, CARTER HENRY.

CHICAGO, UNIVERSITY OF, situated between Washington and Jackson Parks, Chicago, was founded in 1890 by John D. Rockefeller, and opened October 1, 1892. In 1899 there were 210 instructors, 2959 students, endowment of \$5,477,857, productive funds amounting to \$4,095,940, and a library containing 295,000 volumes. President, William Rainey Harper, Ph.D., D.D., LL.D. For other statistics see UNIVERSITIES AND COLLEGES; see also PSYCHOLOGY, EXPERIMENTAL.

CHICKERING, GEORGE HARVEY, who died November 19, 1899, was the last male survivor of the family that became celebrated on account of the pianoforte instru-

ments which bore their name. The late Jonas Chickering, the founder of the present Chickering pianoforte works, died in 1853, leaving three sons—C. Frank, Colonel Thomas E., and George H.—to succeed to the business. The two older sons died some years ago. George H. was born in Boston. When engaged in his business, with which he had not for some years been actively connected, he employed himself largely in its practical exercise in the shop. He was at one time the moving spirit in a musical organization known as the Chickering Club, in Boston, which flourished before the days of the Apollo Club. Of this he was president for a long time, and was more or less identified for years with its executive boards. Recently he had lived quietly at his home in Milton, Mass., where he gave much time to the study of amateur photography, along the line of which his work is said to have been remarkable.

CHILDREN'S AID SOCIETY, organized 1853, for educating and finding homes for poor children, reports in 1899 a daily average attendance in the industrial and evening schools of 7208, and a total enrolment of 15,773. The society conducts among their 22 different schools, situated in various parts of New York City, a school for crippled children (opened 1899), and has 4 lodging-houses for boys and girls, and various health homes, summer homes, etc., in the country. President, D. Willis James; secretary Charles Loring Brace, United Charities Building, New York City.

CHILE, a republic of South America, extends between the Andes and the Pacific Ocean from Peru to Cape Horn. The capital is Santiago.

Area and Population.—Chile is divided into 23 provinces and one territory, the total area of which is 290,829 square miles. According to the census of 1895, the population, exclusive of about 50,000 Indians, was 2,712,145; it is likely, however, that the actual number is nearly 3,300,000. The territory Magallanes, embracing the most southern part of the country, has an area of 75,292 square miles, and had in 1895 a population of only 5170. The largest province is Antofagasta, formerly Bolivian territory; area, 72,204 square miles; population, 44,085; the smallest province is Valparaíso; area, 1659; population, 220,756. (For the demarcation of Atacama, determined by arbitration in 1899, see ARGENTINA.) The dispute concerning the Andean boundary line, farther to the south, and submitted to the arbitration of the government of Queen Victoria, has not yet been decided. In 1895 the urban population was reported to be 1,240,353, and the rural, 1,471,792. At the beginning of 1898 estimated urban populations were as follows: Santiago, 302,131; Concepcion, 49,607; Talca, 39,613; Valparaíso, 139,038. On August 8, 1899, a tidal wave swept into the last-named city, causing damage to the amount of over \$1,000,000. Immigration to Chile is small, exceedingly small in comparison with that of the transandean republic of Argentina; to further immigration a provision of 616,890 pesos was made in 1898. The number of foreigners in Chile is less than 100,000.

Government.—The constitution adopted in 1833 established three departments of government—executive, legislative, and judicial. Executive authority devolves upon a president, chosen by an electoral college, who is assisted by a council of state and a responsible ministry, the members of the latter having charge of the following departments: the interior, foreign affairs, finance, justice and public instruction, war and marine, industry and public works, worship and colonization. The council of state consists of eleven members, five named by the president and six by the congress. The president is Señor Don Federico Errázuriz, who was elected June 25, 1896. The non-federal executive authorities are intendents, presiding over the provinces, and governors presiding over the departments.

A congress, consisting of a senate and a chamber of deputies, holds the legislative power. Senators are chosen for six years by the provinces, and deputies for three years by the departments (subdivisions of provinces); the number of the senators is one-third that of the deputies, and each deputy represents 30,000 inhabitants or a fraction thereof, not less than 15,000. A deputy must have a yearly income of nearly \$490, and senators nearly \$1950. Legislation in Chile is said to be attended with difficulty. The congress consists of representatives of half a dozen different parties, who do not readily reach a majority vote upon anything, except the overthrow of the ministry. This state of affairs, together with alleged conditions of corruption and wire-pulling, is proving deleterious to good government. Legal voters are at least twenty-one years of age and are able to read and write; this class constitutes about one-eighteenth of the population. Justice is dispensed through subordinate courts in the districts, through courts of first instance in the capitals of departments, and through six courts of appeal and the High Court of Justice in Santiago.

Army and Navy.—The regular army, the officers of which number 623, must not number more than 9000 men. There are ten regiments of infantry, eight of cavalry, five of artillery, and a corps of engineers. The national militia, reorganized in 1896, is divided into three parts—active, passive, and sedentary—and is composed of

citizens from twenty to forty years of age. A citizen renders active service in the national guard during his twenty-first year. During 1898 the men enrolled in the three departments numbered 16,309 active; 7301 passive; 5672 sedentary; total, 29,282. The total enrolment of 1896, 1897, and 1898 was 512,700.

The navy consists of five armored vessels, two first-class and three third-class cruisers, fifteen first-class and four second-class torpedo boats, four destroyers, and eleven gunboats. Among the more important vessels are: *Almirante Cochrane*, ironclad, launched at Hull in 1874, displacement 3500 tons, indicated horse-power 2020, nominal speed 13 knots; *Capitan Pratt*, battleship, launched at Le Seyne in 1890, displacement 6900, indicated horse-power 12,000, nominal speed 18.3; *O'Higgins*, armored cruiser, built at Elswick in 1896, displacement 8500, indicated horse-power 16,500, nominal speed 21.2; *Esmeralda*, first-class cruiser, launched in 1896, displacement 7020, indicated horse-power 18,000, nominal speed 23.

Finance.—The chief sources of revenue are export and import customs and accruments from the railways; the largest expenditures are for the national debt, and for public works and salaries. For 1897 the revenue in pesos was 85,439,021; expenditure, 84,614,284. For 1898 the revenue and expenditure was estimated at 76,250,000 and 76,205,164 respectively, but subsequently the estimate for the latter was 79,931,452. The estimates in pesos for 1899 were: Revenue, 93,844,799; expenditure, 80,793,805.

According to the *Bulletin of the Bureau of American Republics*, the following official estimates of revenue and expenditure, subject to revision, were made in the fall of 1899: Estimated revenue and expenditure for 1899, 114,964,434 pesos and 104,576,193 pesos respectively; estimated revenue and expenditure for 1900, 109,749,949 pesos and 104,263,578 pesos respectively. Although the budget for 1899 showed a surplus of some 10,000,000 pesos, the finance minister, in view of extraordinary expenditures which must be incurred on account of recent damages to railways, bridges, and roads by floods, deemed it imprudent to fix the available surplus at more than 4,000,000 pesos.

Chile was on a gold basis from 1896 to July 30, 1898, when a law was passed providing for an issue of 50,000,000 paper pesos. As the law now stands the conversion of these notes will begin on January 1, 1902. The value of the peso in United States currency is \$0.365.

Industries.—The leading industries are agriculture, in which 1,500,000 of the population are engaged, stock-raising, and mining. The country is reported to have an annual production of about 28,500,000 bushels of wheat, and 8,500,000 bushels of other cereals, while over 500,000 cattle and 2,000,000 sheep, goats, etc., are reared each year.

Besides the workings of nitrate, borax, and guano, there are more than 7000 registered mining claims; the chief minerals found are nitrate, copper, silver, gold, coal, and manganese. The fields of nitrate, the output of which seemed to be increasing in 1898 and 1899, cover an estimated area of 220,350 acres; the output in tons for the years 1896, 1897, and 1898 was reported as 1,092,000, 1,064,075, and 1,254,000 respectively. At one time Chile produced about one-third of the copper output of the world; but the discovery of the metal in other countries, together with the low quality of Chilean ores and the primitive methods of mining, caused a decline in production. The recent appreciation of copper has brought about a renewed interest in the industry. Large quantities of coal are produced, but it is inferred that the industry is not in an excellent condition, as in the summer of 1899 the government advertised for Australian bids for supplying 40,000 tons for the railways, about one-third the amount needed.

Manufacturing has not attained a place of importance, though in Valparaiso there are sugar refineries, gas-works, carriage-works, breweries, saw-mills, shoe factories, and works for machine-making.

Commerce.—The total imports and exports in 1897 were 65,502,805 pesos and 64,754,133 pesos respectively; of the former about 75 per cent. and of the exports about 61 per cent. were subject to duty. Among the leading imports, valued in pesos, for that year were: Sugar, 5,989,659; coal, 4,122,918; cottons, 3,937,096; cattle, 2,756,600; sacks, 2,440,209; illuminating oil, 1,458,090. The leading exports included: Nitrate, 37,461,559 pesos; copper (in various forms), 5,647,924; silver (bar, ingot, and ore), 4,215,356; wheat, 2,599,640; iodine, 2,629,370; coal, 1,869,310; shoe-leather, 1,344,005. Of the exports in 1898 over 75 per cent. represented mining products; agricultural exports were less than 8 per cent. On the 1st of January, 1898, when an increased tariff law went into effect, there began a falling off in the import trade at Valparaiso. The largest part of the foreign trade is with Great Britain and Germany, the former being far in the lead.

According to a report of the Chilean legation in Washington, as published in the *Bulletin of the Bureau of American Republics* for December, statistics of the nitrate industry up to the end of October, 1899, are as follows: Total production, 1,138,626

tons; total exports, 1,064,044 tons; of this export there were sent to Europe 917,503 tons, to the United States 125,665 tons, and to other countries 20,876 tons. In 1899 the wheat crop suffered from unfavorable weather. The estimated amount available for shipment to Europe was about 40,000 tons; the export to Europe in 1898 was 76,964,606 kilograms (about 84,600 tons); the barley export in 1898 was 16,405,528 kilograms.

Shipping and Communications.—The merchant marine comprised on the 1st of January, 1897, 160 vessels aggregating 80,270 tons; of these 48 were steamers of 25,521 tons net. In the foreign trade there entered the Chilean ports in 1896, 2193 vessels, tonnage 3,315,426, and cleared 2346, tonnage 3,961,996. The total tonnage of coasting vessels entering in 1896 was 6,656,603. Besides English and Chilean steamship lines to Peru and Panama, there are English, German, and French lines to European ports; in 1899 a company was formed for establishing a line between Chilean and Spanish ports.

The total length of railways open for traffic in 1897 was 2661 miles; of these 1233 miles were owned by the state and cost 82,269,660 pesos. Concerning the Transandean Railway, which for some time has been in process of construction and which will connect Valparaíso with Buenos Ayres by way of Mendoza, it was reported in the fall of 1899 that, contrary to former plans, it will not touch at Uspallata, on account of the great expense involved, but will probably cross the Andes a little south of the 34th parallel and of Maipo Mountain. The highest point thus attained would be 7546 feet above sea-level. When the road is completed the journey from Santiago to Buenos Ayres will not take, it is said, more than forty hours.

Religion and Education.—Toleration prevails for all religious faiths, but the state religion is Roman Catholic. In 1898 ecclesiastical subsidies amounted to 578,888 pesos. Education, which is free but not compulsory, is classified as primary, secondary, and professional. In 1898 the public primary schools reported numbered 1368, and the total enrolment was 99,831; in addition there were 396 private schools with 15,785 pupils in attendance. For secondary and professional education there are various lyceums and colleges, and the National University and the National Institute at Santiago. In 1897 the student enrolment at the Institute was 1278, and at the university 774. Besides the public and private schools there are at the seats of the bishops seminaries under church control; the instruction given is similar to that of the government schools. In 1897 the total state expenditure for instruction was 5,633,021 pesos. The national library at Santiago comprises more than 86,000 volumes and 24,000 manuscripts.

CHINA CLAY. See KAOLIN.

CHINESE EMPIRE comprises China proper and the dependencies of Manchuria, Mongolia, Thibet, Jungaria, and Eastern Turkistan. China proper has an area of about 1,336,841 square miles, with a population of about 386,000,000. Including the dependencies, the area is about 4,218,401 square miles, and the population 402,680,000, though some estimates place the latter as high as 430,000,000. The Europeans number about 10,000, of whom 4000 are British, and more than half of them are centred at Shanghai.

Production.—Agriculture is the chief occupation, and in general the land is divided into small holdings. In the south the chief product, as well as the chief article of food, is rice, but sugar, indigo, and cotton are also cultivated. In the north the chief products are wheat, maize, and millet. The soil is very fertile, especially in the valleys of the large rivers. Labor is cheap and abundant, and in spite of the primitive methods of cultivation the yield of the land is large. Two or three crops of cereals are commonly raised in a single year in the fertile valleys, and three and sometimes four crops of vegetables. It is estimated that an eighth of the cultivated surface of China is taken up with rice, the average annual crop being about 500,000,000 hectolitres. Next in importance is tea, which is cultivated especially in the region between the Yellow River and the Yang-tse, the annual crop being about 400,000,000 kilograms. Tea is cultivated especially in the southern and western provinces. Silk cultivation is also an important industry. The mulberry-tree grows in all parts of the country, but silk-raising achieves its best results in the province of Keang-su, Sze-chuen, Che-keang, and Kwang-tung. According to some estimates, the number of silkworms raised in China is nearly two-fifths of the total world's production. In China proper not much attention is paid to cattle-raising, milk products not being common articles of food. The common domestic animals of the Chinese are pigs and poultry. The country is not as a rule well wooded, though the mountains and hill-sides have considerable timber, and in some parts of the country the forest products are exploited. The mineral resources of the country are very great, although but partially developed. They comprise silver, gold, copper, mercury, iron, zinc, lead, petroleum, various mineral salts, and, above all, abundant

coal measures, China being regarded by some as the chief coal country in the world. Coal, in fact, is found in all of the eighteen provinces, and the mines, which have been worked under foreign control, have been very productive. The development of the mineral resources, however, awaits foreign capital and enterprise. Important steps were taken in 1898 and 1899 in this direction, and some account of the concessions made by the government to foreigners will be given in a subsequent paragraph. The manufactures of China are not yet important, although there is a movement to develop a cotton industry at Shanghai, and a silk industry at Shanghai, Canton, and other cities. The cotton mills promise to become formidable competitors of the foreign cotton manufacturer on account of the low price of Chinese labor. At Tientsin there have also been established a number of flour-mills. Very crude implements are employed in the industries. "Labor-saving devices are not in demand in China," writes one of our consuls. "The cheapest thing here is a man." See COTTON AND COTTON INDUSTRY; SILK MANUFACTURING.

Foreign Trade.—Foreign commerce is confined to the treaty ports, of which there were 33 at the beginning of 1899. In the course of a year a new port, that of Yochow-fu, was opened on the Yang-tse River. Complete statistics for the foreign trade of China are not available. The only official source of information is the bulletin issued by the Chinese customs office, and this does not state the origin of the different classes of merchandise, but includes the products of European countries under the mere head of the continent of Europe. Exceptions to this rule, however, are England and Russia, whose trade is reported in separate publications. For the United States the Consular Reports are the chief authority. The following list shows the countries trading with China in the order of their respective shares of the trade: 1, England and her colonies; 2, Japan; 3, United States; 4, Russia; 5, Germany; 6, France and her colonies; 7, Belgium; 8, Austria; 9, Switzerland. The statistics of commerce by flag do not show the relative importance of the trade of the different countries, since the flag does not necessarily indicate the origin of the merchandise, but are important as indicating the distribution of the shipping. The following table, taken from the United States Consular Reports of September, 1899, shows the trade by flag in the year 1898:

Flag.	Number of Ships.	Total Values of Foreign and Coast Trade.	
		<i>Hk. tons.</i>	
British.....	22,609	508,941,986	\$352,719,906
German.....	1,831	52,185,811	36,216,536
Japanese.....	2,262	90,073,053	90,870,690
French.....	577	19,807,270	12,399,345
Swedish and Norwegian.....	498	11,619,621	6,064,156
Russian.....	118	5,142,666	4,263,010
American.....	743	4,327,530	3,003,306
Danish.....	206	2,735,275	1,896,281
Austrian.....	16	1,070,232	742,741
Korean.....	8	719,681	499,369
Dutch.....	18	635,312	440,837
Non-treaty powers.....	23	408,097	283,219
Italian.....	.....	6,525	5,778
Spanish.....	2	2,061	1,480
Portuguese.....	141	661	369
Chinese.....	23,547	334,422,970	232,080,541

While the United States stands immediately after England and Japan in respect to the importance of its trade with China, it ranks very low on this list on account of the large body of goods which are carried in the ships of other countries, especially in those of England and Germany. The larger part of American petroleum, which is one of the chief imports from the United States, is brought to China in English vessels. Certain nations formerly represented in the colonial trade with China are no longer on the list, their goods being brought to China in the ships of other nations. Belgium, for example, has a larger commerce with China than Sweden and Norway, and yet has no share in the carrying trade. In respect to shipping Germany stands next to England, but the value of German cargoes by no means represents the trade in German goods, since the German flag covers large quantities of the merchandise of other countries. Statistics for the foreign trade during the calendar year 1898 are given in the United States consular reports for September, 1899. Despite a number of obstacles which might well have checked China's foreign trade in that year, the total volume of her foreign trade was valued at a higher figure than was ever before recorded. The interruption of the business caused by several sporadic revolts, by the floods of the Yellow River, by rumors of war, and by the insecure political

situation did not prevent the commercial expansion. The investment of foreign capital in China has steadily increased in recent years, and has greatly stimulated commercial activity. For a period of twelve years—that is, from 1886 to 1898—there has been an annual excess of imports over exports, amounting on an average to about 34,000,000 Haikwan taels. The official statistics, however, by no means represent the whole of China's foreign trade. There are no statistics for the junk traffic with Corea and the countries to the south, nor is there anything but a rough estimate for the large trade with Mongolia and Thibet. The following table shows the value of the trade by countries in 1898:

Country.	Imports.		Exports.		Total.	
	<i>Hk. taels.</i>		<i>Hk. taels.</i>		<i>Hk. taels.</i>	
United States	17,163,312	\$11,911,339	11,986,771	\$8,818,819	29,150,083	\$20,230,158
Great Britain	84,963,474	24,263,967	10,715,963	7,436,871	45,678,426	31,700,838
Continent of Europe, including all the Russias	11,151,890	7,739,405	43,727,321	30,346,760	54,879,201	38,086,165
Japan, excluding Formosa.....	22,581,812	15,671,778	15,168,148	10,523,692	37,749,960	28,198,472
Hong-kong	97,314,017	67,466,528	63,083,512	43,065,968	159,397,529	110,532,486
Formosa	4,794,261	3,823,210	924,639	641,622	5,718,890	3,968,902
India.....	19,135,546	13,290,069	1,524,125	918,943	20,459,671	14,199,012
All the rest of the world.....	11,742,055	8,148,986	13,106,090	9,096,043	24,848,745	17,245,029

The net value of the imports in 1898 was \$145,448,058, which exceeded that of any previous year, and was 6,750,709 Haikwan taels in excess of the value for 1897. It is estimated that the value of the imports between 1886 and 1898 increased 145 per cent. The exports in 1898 were valued at \$110,371,781, a slight decline as compared with the previous year, but an increase over the general averages of the years before 1897. This increase has taken place in spite of the falling off in the exportation of tea and silk, in both of which there were signs of decadence, although the decrease in the importation of tea was partly due to the new duty in the United States and the enforcement of a higher standard of purity. There has been a steady increase in the exportation of the following articles: Hemp, hides, leather, mats and matting, oils, tobacco, and feathers. In regard to the competition of foreign countries in the trade with China the following statements of recent writers may be of interest: One of the most striking features of recent commercial history is the rapid development of German trade. Germany has attained a strong position in the eastern trade, and in many places competes successfully with England. Thirty years before her commerce with China was of little importance, and her flag was rarely represented in Chinese waters. Now seven lines of steamers ply between Germany and China, and she ranks next to England in the importance of her shipping. In 1882 Germany had 56 business houses in China. In 1899 the number was reported at over 100, being centred especially at Shanghai and Tientsin. At all the principal Chinese ports German houses are represented. England, a short time ago, had nearly a monopoly of the sale of cotton goods in China, but latterly has encountered the active competition of the United States and Japan, the latter country having shown herself an especially powerful competitor, owing to the large amount of cheap and effective labor at her disposal. Japan, the United States, and Russia have nearly kept pace with Germany in the expansion of their Chinese trade. Japan has been especially successful in placing on the Chinese market its cottons, charcoal, and matches. Russian petroleum has found its way into China in quantities nearly equal to those sent by the United States. She imports from China, on the other hand, great quantities of tea, the centre of the Russian tea trade being Hankow. But, according to the reports of the British official who has charge of the collection of customs duties, American goods, especially cottons, have gained more rapidly than the imports from any other country, and the Chinese are taking increasing quantities of American machinery, oils, and food-stuffs.

Trade with the United States.—The trade of the United States with China has expanded greatly in recent years. The staple imports from the United States are kerosene and cotton goods. Between 1887 and 1897 the imports of cotton goods and yarns from the United States increased from 22.36 per cent. of the total to 33.04 per cent. of the total, Great Britain supplying almost all the rest. The greater part of the cotton goods come from New York by way of the Suez Canal. The market for this class of articles seems capable of indefinite extension, since the numerous population of China depend almost solely upon cotton as the material of their wearing apparel, and the opening of the interior to foreign commerce will greatly extend the effective demand. The importation of kerosene from the United States increased during the same period in even greater proportions. During ten years, in fact, it nearly tripled. It encounters the competition of Sumatra petroleum, but a more

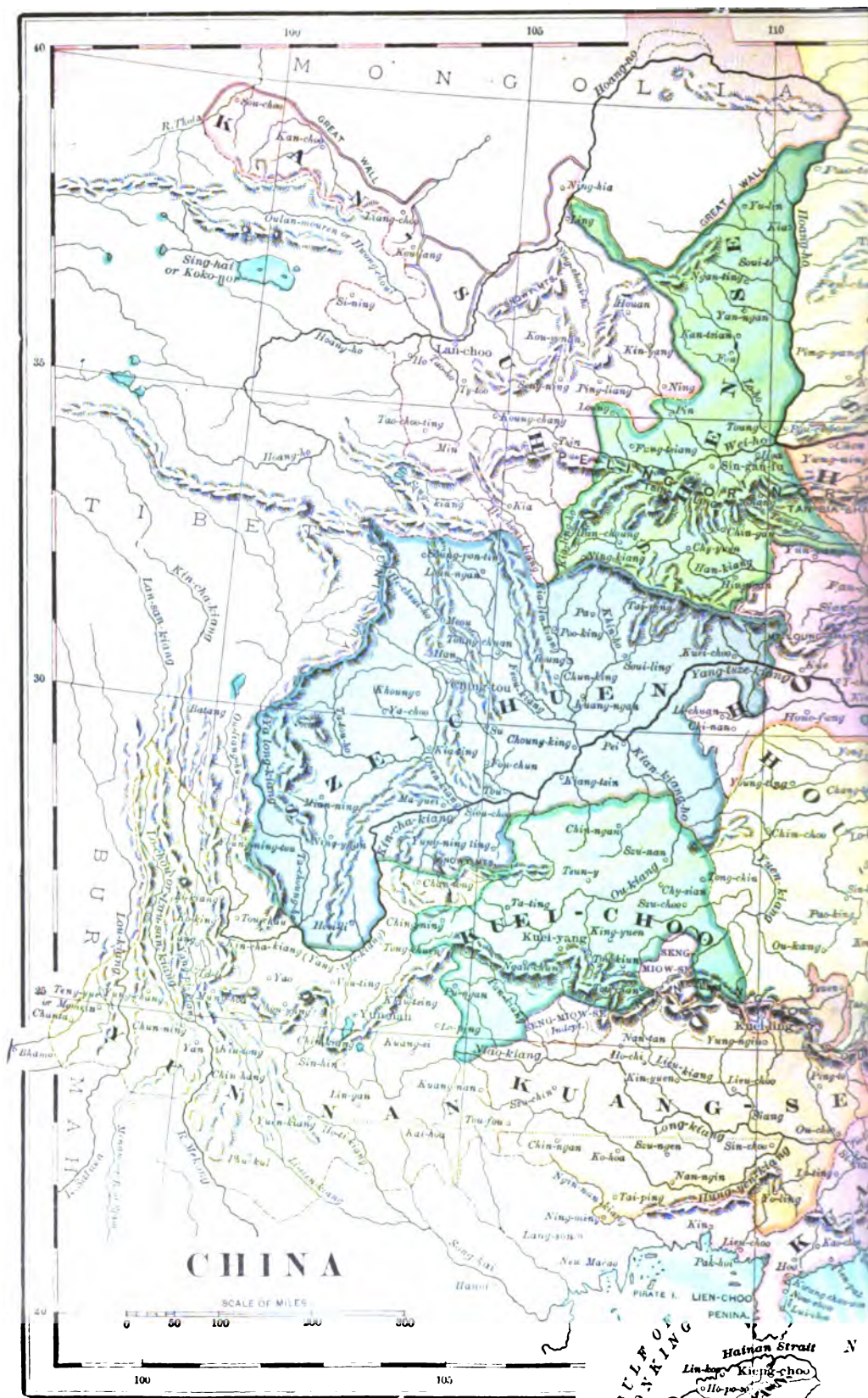
serious competitor is Russia, which has come to the front since 1891. In that year the Russian petroleum was hardly more than one-fourth of the American imports, but it exceeded the latter in 1895 by about 3,000,000 gallons. In 1897, however, the American petroleum exceeded the Russian by more than 7,000,000 gallons, being nearly 48,250,000 in that year. The greater part of the American kerosene comes from New York and Philadelphia by way of Suez Canal. Flour has occupied the third place in American importations and more than doubled in the period between 1887 and 1897. It is preferred by the Chinese to the imperfectly refined flour of their native mills, but the flour-mills recently established at Tientsin seem to indicate that in the course of time the Chinese may produce a better grade for themselves. In iron and steel and in some highly wrought articles, like machinery, watches, and clocks, the commerce of the United States has also been increasing. From China the staple exports to the United States are tea and silk. About one-half of the tea in 1897 came from China. The silk in 1897, most of which was raw silk, reached a figure of nearly \$5,000,000. One of the most significant features of the expansion of the American trade with China is the successful competition of American cotton goods with the products of Manchester. The favor with which American cotton goods have been received in China is attributed by some to their cheapness, but our consuls account for it rather by their superior quality. The defective method of setting forth the foreign trade of China makes it impossible to ascertain what the trade of the United States is really worth. A large part of it is credited to Great Britain because it is carried in British ships—for example, the shipments from Atlantic ports to China via England. The entire American trade with the ports of China south of Shanghai goes through Hong Kong, but the figures are credited to Great Britain. In regard to the imports from the United States, it is stated by our consular agents that we sell ever-increasing quantities of lumber, household stores, lamps, iron, etc., as well as the staple articles of trade already mentioned. For these commodities it is impossible to secure complete statistics, but it is estimated by our consuls that while Great Britain in 1895 sold five times what the United States did, she sold in 1898 only twice as much. It is further pointed out in connection with the trade of 1898 that while those powers that had taken parts of Chinese territory during that year suffered severe losses in trade, Japan and the United States were gainers. Yet while the trade of the United States with China has increased with remarkable rapidity, it still forms only a small fraction of the total, so far as it can be traced through the defective official statistics. In 1889 the imports from the United States to China were 2.2 per cent. of the total imports from all countries, and in 1898 they were 6.3 per cent. The figures for 1898 are given above. For the 1899 figures see UNITED STATES.

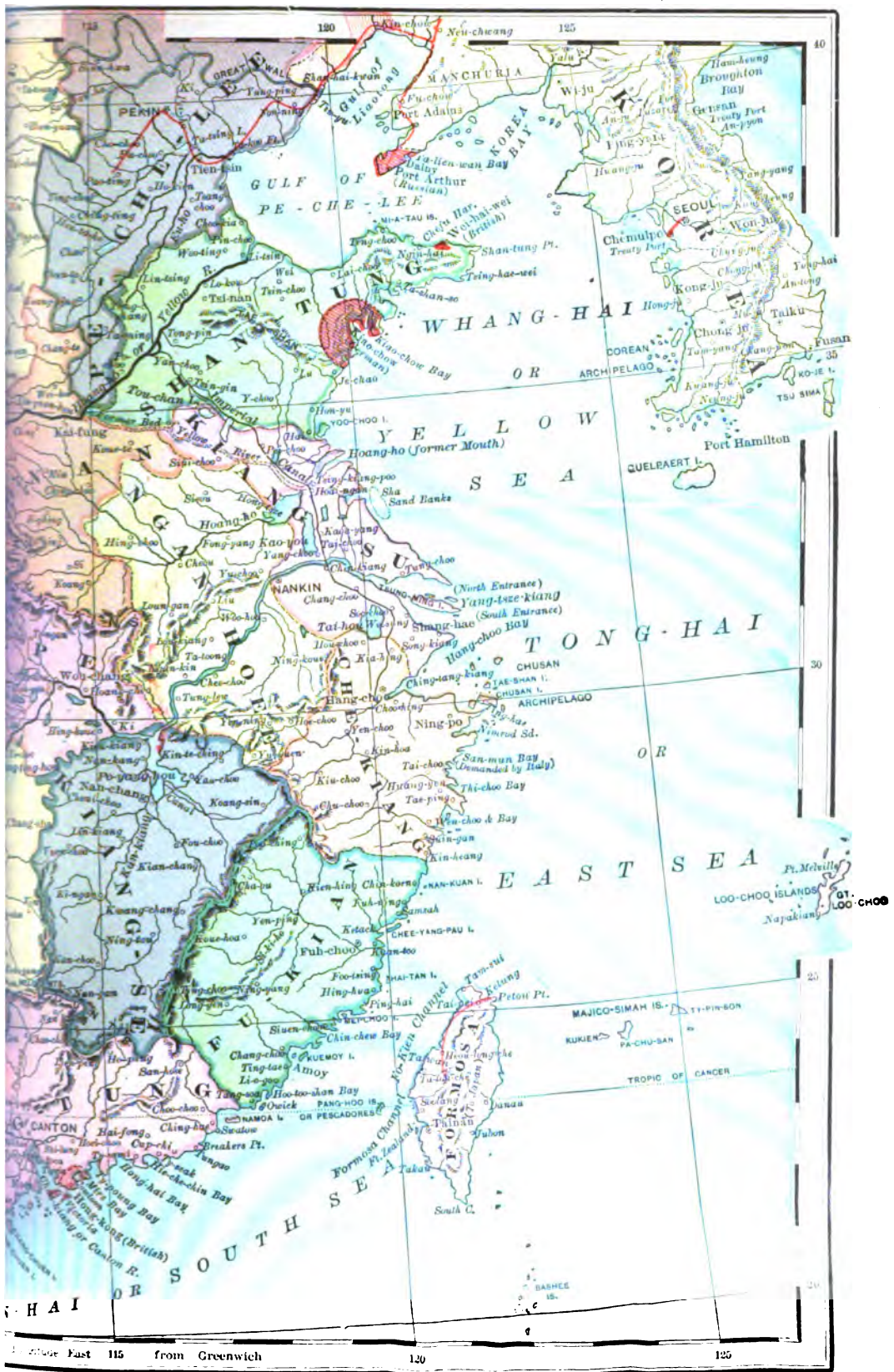
Efforts to Promote Trade.—There has been much discussion of late as to the best means of promoting trade with China. The slow progress of British trade in the Far East has been a matter of concern among the British capitalists, and the British China Association has taken the matter in hand, acting upon the suggestions offered by Lord Beresford after his return from his visit to China. The reasons assigned by the association for the slow development of the British trade in China were: First, the bad faith of the Chinese in the observance of the treaty obligations; second, the lack of security for foreign capital, excepting at the treaty ports; and, third, the general apathy and ignorance in the matter of trade with China. Many instances are cited of the evasiveness of the Chinese in the matter of their promises. It is pointed out that the seeming concession in respect to inland navigation has amounted to very little, since foreigners are still forbidden to reside for purposes of trade anywhere except at the treaty ports. Without the right of establishing stations in the interior and maintaining agents there to protect foreign goods, the opening of the inland waters to navigation cannot develop trade. There is, moreover, a danger that internal trade may be subjected to excessive taxation, and the vital question to the foreign capitalist is, can the central government protect the internal concessions and prevent their injury from the rapacity of provincial officials? The chief desire of the British and American shippers is for a strong central government, and it is the general opinion that internal trade will not develop rapidly until some measures of administrative and fiscal reform are adopted. The British China Association emphasizes the fact that nothing has ever been gained from the Chinese government except through pressure backed by threats. The American Association of China was formed at Shanghai on December 16, 1898, for the purpose of fostering United States trade with the Far East, of obtaining and distributing information, and of uniting in a common organization those who are interested in eastern commerce. Like the British shippers the chief cause of their alarm is the weakness of the central government and the fear that it will be unable to protect the foreign trader. Referring to the concessions which the government has made to foreign countries, the president of the American Association of China pointed out that the treaties promise equal privileges to all and that these claims are in contravention of treaty rights. At the same time China appears to be helpless in this matter of maintaining treaty obligations.

Need of Administrative Reforms.—The old story of the Chinese practice of granting concessions without the least intention of making them good was repeated in 1899. For example, the opening of the inland water-ways to European steamers was supposed to be a great step toward the development of internal trade. It was soon found, however, that the advantage of transit along the water-ways was confined to passengers. To the carrying of goods serious obstacles were presented by the provincial administration, which feared the loss of its privileges of inland taxation. All sorts of difficulties have been put in the way of river traffic, which is met by exactions on the part of the officials at every point. The chief obstacle to effective administration in China is the inadequacy of official salaries. It is said that many mandarins of high rank receive no more than £50 a year as a salary. Their allowances and emoluments may bring the amount to £250, but out of this they are obliged to maintain the dignity of their position, pay for their retinue and secretaries, and entertain guests in a manner befitting their rank. The expenses of the office in many instances are from ten to twenty times the amount of the legitimate salaries. It is understood that these expenses will be met by levying toll upon the money that passes through official hands. As a result speculation is recognized as absolutely necessary, and official honesty under such a system becomes impossible. This corruption is especially marked in the imperial administration, and is so ingrained in the system that it has seemed impossible to eradicate it. It was recently estimated that a certain Chinese official had made away with some fifteen million dollars in the course of his tenure of office, but the Peking authorities, knowing the extent of his opportunities, kept close watch on him, and in the end got their hands upon the money, so that he left his office no richer than when he assumed it. Recent writers have advocated the reorganization of the administration under foreign control, and have urged that this should begin with the provincial administration, which appears to be less corrupt than the imperial. Reorganization by means of natives is said to be impossible, owing to the negligence or indifference of the Peking authorities, and to the degree to which corruption has become entrenched. As things are now the moneys collected by the officials seldom find their way to their proper destination. It is impossible to maintain the army in a state of efficiency if this system of plunder continues in force.

The Opening up of China.—An account of the recent progress in the development of China has been given in the last issue of the YEAR BOOK. The events that have occurred since the treaty of Shimonoseki have amounted almost to an industrial revolution. Within the past four years the right to establish manufactures in the open ports has been granted to foreigners. In 1898 it was decreed that all the navigable rivers in thirteen out of the eighteen Chinese provinces were opened to steam navigation, but, as above stated, this measure did not realize the hopes that had been based on it. Since the war with Japan twelve new treaty ports have been opened. Another important change is the systematization of taxation in one of the largest and richest portions of the empire, through the transfer of the *likin* tax of the Yang-tse basin to the control of the imperial customs service, of which Sir Robert Hart is in charge. Considerable progress in railway building was made during the year 1899, but, before describing that progress in detail, the following statement of the present condition and extent of railways in China may be of interest.

Chinese Railways.—Statistics showing the railways constructed or in process of construction in the summer of 1899, together with an account of the various railway projects, are given in a statement by M. Pierre Leroy-Beaulieu, of which the following is a brief summary. The opposition which superstition and ignorance offered to any improvements in matters of industry or transportation prevented the progress in railway building until 1876. In that year a short line of about 11 miles was built by Europeans, connecting Shanghai with its deep water port, Woosung; but in the following year it was torn up by the Chinese authorities. Not long afterward, however, Li Hung Chang was prevailed upon to permit the construction of a short industrial railway between the coal mines of Kaiping and the nearest navigable river, the Petang, which line was afterward prolonged to Tien-tsin on one side and to Shanghai-Kwan on the other, and this line of about 174 miles was the only railway in China until 1896. After the war this line was prolonged to Peking, a distance of about 84 miles, but it was ill-managed, had very little rolling stock, and yielded but a small profit. There was an addition of 40 miles on the north of the Great Wall, and this brings the total number to 298 miles for the network of the Pechili, and to this 11 more miles were added in 1898 by the reconstruction of the road from Shanghai to Woosung. English and American engineers have directed the construction, and the mechanics on the road are still Europeans or Americans, but all the other employees are Chinese. This shows a marked contrast to the Japanese railways, where the employees are all natives, but it is thought that it will not be long before the Chinese replace the Europeans. The Peking-Tien-tsin line has met with great success, and is thought to mark the beginning of a period of progress in railway building. Since the treaty of





Shimonoski the concessions to the Europeans comprise some 6210 miles of track in the empire, and upon some 2484 of these work has already been begun. In regard to the remainder M. Leroy-Beaulieu says that for some the funds have not been subscribed, and for others the contracts have hardly been signed. The rivalry of foreign powers in the attempt to secure concessions has repeatedly entangled the Chinese government in diplomatic difficulties.

A brief summary may be given of the various projects which comprise the 6210 miles above mentioned. The first concession was to the Russian government for the Manchurian railways known under the official title of the Railways of East China. These comprise 885 miles for that section of the Trans-Siberian Railway which lies in Chinese territory. The terminus of this line is at Vladivostok. A line of 497 miles connects this terminus with Port Arthur, and a short branch joins the Port Arthur section with the open port of New-Chwang. The Russian government has entire control of these lines, those of eastern China being wholly dependent upon the St. Petersburg ministry of railways and communication. The main importance of these lines is strategic, for the country is not populous and cannot compare with central China in wealth. Work on the Manchurian railways was begun in 1897, and is being actively carried on at the present time. Sections are in progress from Trans-Baikalia, from the Russian littoral province on the banks of the Soungari, from Port Arthur and New-Chwang and large numbers of engineers and many tons of steel rails have been obtained from France and America. A line from Shanghai-Kwan to New-Chwang will connect the Russian network with Peking and a branch of Sin-Minting will open connection nearly as far as Moukden. These connecting lines will comprise 258 miles, and exploitation will be under the control of the British and Chinese Corporation, at the head of which is the house of Jardine and Matheson and the Hong-Kong and Shanghai banking corporation.

Germany has secured from the Chinese government a concession for a network of lines on the other side of the Gulf of Pechili. The German project promises well, for this region is one of the richest and most densely populated of China, having about 572 inhabitants per square mile. The lines to be constructed by the Germans will comprise 621 miles altogether, and form a triangle surrounding the mountainous region in the centre, extending from Kiao-Chau by way of Tsinan to the Yellow River and draining the traffic of the three provinces of Shensi, Shansi, and Honan. Another important line is that proposed to connect Peking with Hankow. It is noteworthy as the first railway project permitted by the Chinese government. It was started first in 1889 by a celebrated Chinese official, but, though progressive in his ideas, he distrusted foreigners and insisted on relying solely on Chinese capital and labor for the enterprise. The project was abandoned until it was taken up by a Franco-Belgian syndicate, which asked for the concession in 1898, but was thwarted for the time being by the diplomatic opposition of foreign powers. The concession was finally made, and in April, 1899, the formal grant was signed. The prospects of this line are most promising. At one end of it is the Chinese capital and at the other the dense mass of population gathered in and about the three cities of Hankow, Wuchang, and Hanyang. Hankow itself is regarded by some as the chief commercial city of the empire, and has been called the very heart of China, for, while it lies about 630 miles from the mouth of the Yang-tse-Kiang, vessels of the heaviest draught can reach it without difficulty. Work on the line has already been begun, and 50 miles have been constructed from Peking. In the summer of 1899 it was expected that it would be completed in 1903 or 1904. Another great project is that of a line, comprising over 600 miles, from Tien-tsin to Tching-Kiang on the Yang-tse, which has been entrusted to a group of Anglo-German capitalists. It also traverses a fertile and populous portion of the empire. The construction will be under the direction of English and German engineers. Among the minor projects are a branch of 186 miles to connect the Peking-Hankow line with Tai-Yuen-Fu, the capital of Shansi. The Russo-Chinese bank holds the concession, and work will be begun as soon as the Peking-Hankow line reaches Ching-Ting, from which point the new branch line will start. A prolongation to the southwest toward Singan-Fu is expected. In the rich Yang-tse Valley the British-Chinese Corporation has obtained concessions for the construction of two lines starting from Shanghai, the one extending toward the northwest and the other toward the southwest. In southern China there have been far fewer concessions of railways than in the north, for the contour of the surface is unfavorable, and the only important line yet conceded in this region is that from Canton to Hankow, comprising 600 miles. From the French colony the lines entering southwestern China are that from Laokai to Yunnan-Sen, 248 miles, that from the neighborhood of Langson to Long-Chau, about 22 miles, and that from Nanning-Fu to Pakhoy, 155 miles. Great difficulties attend the construction of these lines and they are likely to be less productive than those in the north. Further information in regard to railway concessions is supplied by the statistical bureau of the United States treasury in its bulletin on the commerce of China. South of the

Yang-tse the American and British lines are the only ones that have received concessions, with the exception of comparatively short concessions to French lines in the territory adjacent to the French dependency of Tonquin in the extreme south. A British line is planned to connect the treaty ports of Wen-chow, Ning-po, and Hang-chow with Shanghai, and to run north and south at a short distance from the coast, with the ultimate design of reaching treaty ports farther along the coast and terminating in the vicinity of Hong-Kong, with which it will be connected by a short British line now in process of construction. American interests are chiefly concerned in a single but important line to connect Canton with Hankow and to pass through a rich and very populous agricultural section, tapping an important iron and coal region at its centre. It is expected to connect with the proposed Belgian line at Hankow, and thus come into direct communication with Peking. It will also extend to the Yang-tse at a point several hundred miles from its mouth, and afford the products of the upper valley access to the coast. The concession was granted in April, 1898. The French lines are planned for the purpose of connecting the cities and navigable rivers of Tonquin with the trading centres of southern China, as well as with the navigable waters of the West River, which afford communication with the port of Canton. An important line lying to the west of the proposed American line is projected for the purpose of connecting the province of Su-chuan with Canton and Hong-Kong. It is under British control. If carried out it will afford communication between the capital of Su-chuan, which is one of the largest, most populous, and most productive of the Chinese provinces, with the important port of Woochow on the West River. Another proposed British line will connect China with the railway system of British India. This project calls for the extension of the existing railway line from Mandalay in Burmah to the Chinese border at Kun-Long. Thence an extension is proposed in a northeasterly direction to the city of Yu-nan and thence to Chun-king in the province of Su-chuan, thus coming out at the head of navigation on the Yang-tse. Since it would cross the line between Canton and Su-chuan it would complete communication between the British Indian possessions and the commercial centres of China, and bring the vast railway system of India, with its length of 25,000 miles, into communication with the Chinese and Trans-Siberian systems. Until now the lines have been built under the control and at the expense of the Chinese government, but the recent concessions throw the work open to the capital of foreign residents. In general the funds are to be raised by a mortgage, and the lines are to remain in the control of the foreign lenders until the mortgage lien is paid, after which they become the property of the Chinese government. Foreigners have not yet usually succeeded in obtaining a stock interest in addition to the mortgage liens, but the loans usually run for so long a time that the foreign lenders will practically own the roads. In the case of the American contract it will be possible for the capitalists to a certain extent to share in the profits. The Chinese government has shown its intention to obtain the final and complete control of the railways, and has stipulated in making these concessions that a certain proportion of the employees of the road shall be natives and that schools of instruction for Chinese in the construction and management of railways shall be established. Regulations for railways and mines have expressly required that every endeavor shall be made to have the proportion of Chinese capital greater than that of foreign capital, and to insure the ownership of at least three-tenths of the shares by Chinese. They further provide that no concession shall be granted in cases where all the money is foreign, and that the Chinese government shall receive four-tenths of the profits of railways and 25 per cent. of mines.

Mining Concession.—An Anglo-American company obtained in 1899 an important concession for the development of mines and oil-fields in the rich and populous province of Sze-Chuen. At the head of the enterprise was Mr. Pritchard Morgan, an English merchant. The regulations under which the enterprise was organized provided that the work should be done conjointly by Chinese and foreigners, and that the profits should be divided proportionately. It permitted foreigners to hold 50 per cent of the shares, but declared that there should be no monopoly for any one country. These regulations further stated that no company composed of foreign shareholders only should be allowed to work any of the mines. The attitude of the government toward foreign exploitation is illustrated by the following quotation from these regulations: "The area of Sze-Chuen is very extensive and all sorts of mines exist. Chinese who work on their own property are only required to obtain the necessary permission, and pay the necessary taxes, according to the rules in force, and they are in no way restrained. But if foreign merchants undertake to work the mines their operations must be limited in some way or other. They must confine themselves to certain intendancies, prefectures, or districts, and not take the whole province as their sphere of work." Another provision is that the "mining bureau is to act as intermediary between the superiors and subordinates, and is to attend to all negotiations between natives and foreigners, and matters of protection."

The Yang-tse Region.—It will be remembered that the Chinese government recognized certain claims of the British affecting the Yang-tse region. The concessions of the Chinese government have been differently interpreted, but are held in general to mean that British interests in that region shall be safeguarded. It cannot be said that the Yang-tse region has actually become a British sphere of influence as that term is ordinarily used. Last year the tendency was toward the sphere of influence status, but that status is not yet firmly established. When the Peking government granted to a Belgian syndicate, under the pressure of Russo-French diplomacy, the right to build a trunk railway in the Yang-tse Valley, a protest was made on behalf of Great Britain, but this protest was not sustained. The first real acknowledgment of an industrial sphere of influence is to be found in Germany's opposition to the concession to an Anglo-American syndicate of the right to build a railway across Shantung, since this opposition led to a compromise whereby England controlled the section of the road in Kiang-Su, while Germany controlled that which passed through Shantung. The Peking government provided that no portion of the Yang-tse region should be mortgaged, leased, or ceded to any other power than Great Britain, but this came too late to prevent the concessions to Russia and France at Hankow in 1896. The Yang-tse region has been defined as the districts through which streams flow into the Yang-tse, including also the provinces bordering on the Yang-tse, together with Chekiang and Honan.

The British Policy in China.—The British sphere of influence has been held to include all the Yang-tse Valley territories, and more than one-half of the province of Kwang-tung. In the course of the year there has been a great deal of discussion as to what Great Britain's future policy toward China would probably be. Its importance appears from the fact that the portion of China comprised within the British sphere of influence makes up about one-half of the Chinese Empire. If Great Britain consents to the partition of China, and if the so-called sphere of influence becomes virtually annexed by foreign powers, some serious difficulties are likely to arise. Apart from the moral side of the question, it is held by some to be a mistake to attempt the annexation of the Chinese territories. The hatred of the Chinese for foreigners and the stubbornness of their character present grave obstacles to anything like an assimilation to the peoples of the west. It has been said that since the war with Japan the tendency has been as much to underestimate the fighting capacity of the Chinese as it was to overestimate it before that war. The complete collapse of the military and naval power of the Chinese at that time was due, it is said, to mismanagement and lack of discipline, and not to any incapacity for fighting on the part of the people. It is thought that so hardy and stubborn a race would make good fighting material in the hands of skilful officers, and, when stimulated by race hatred, would be very hard to subdue. That race hatred continues to be a powerful motive among the Chinese is attested by the recent formation of a good many anti-foreign societies, both secret and open, whose influence is widespread and shows itself from time to time in outbreaks against foreigners.

A writer in a British review, who has had much experience in Chinese affairs, sees little prospect of success in any scheme for actual occupation. He thinks, however, that the aim of British policy should be the control of the administration of the provinces within its sphere of influence, this control to be quietly and gradually introduced and to be made, so far as possible, to harmonize with the spirit of the people. It is his idea that the provinces should be governed through the native officials, thus preventing all actual contact between the Chinese and the hated foreigner. Everything should be directed from above, and the power at the centre should be a British resident. This distant and mysterious force would, he thinks, give little concern to the slow-minded natives, who seem to care only for their local affairs, and who have little of that patriotism which would impel a western nation to resist foreign interference with its central government. Under British control the native administrators would be trained in government and gradually a more enlightened and progressive system would be devised. The constant extortions practised by the present officials would be prevented and the condition of the people improved, and, the whole thing being done silently and from afar, race antipathies would not be aroused. As to the necessity of such a course it is urged that revolts most dangerous to British interests are likely to break out at any moment. As matters stand now the British subject would have to appeal to Russia for protection, owing to the lack of British military forces in that region. There is no knowing when such a movement as the Tai-Ping rebellion might recur. The safety of British interests and the welfare of the people require the presence of a strong force and the maintenance of effective control in order to suppress such disorders at the start.

These and other suggestions have been made in regard to the proper attitude of Great Britain toward the Chinese question. In general, however, the attitude of

Lord Salisbury's government has been unaggressive. It has aimed to maintain the open door and prevent partition, and, on the whole, it has been favorably received.

Lord Beresford's Mission.—The results of Lord Beresford's investigation of the commercial situation in China in the course of the mission which he undertook on behalf of the British Associated Chambers of Commerce in 1898, were summed up in his book, *The Break-up of China*, which was published in May, 1899. His main argument is that the break-up of China would not only be disastrous, but needless, and he is an advocate of the "open door" policy as against the doctrine of "spheres of influence." The open door policy, he says, meets with the support of all the British trading communities in China. The rulers themselves professedly incline to it, though they do not speak encouragingly of its prospects. They emphasize the difficulty of opening China to trade, and especially of affording adequate security to the foreign trader. Lord Beresford holds that to maintain the open door policy is a work of extreme difficulty, and that its success will depend mainly upon the energy and ability which the commercial classes bring to the task. Without the active co-operation of these classes the government cannot maintain the open door. But what the government must do in order to insure the success of this policy is practically to assume the charge of almost every department of internal administration. Lord Beresford complained that foreign trade with China is hampered in every possible way, and that there is little security for property outside the treaty ports.

Currency and National Debt.—Copper cash constitutes the circulating medium through the greater part of China. There are 1800 of these coins to a gold dollar, and, as wages and expenditures are commonly estimated in cash, an idea may be formed of the ordinary schedule of prices. Among foreigners the Mexican dollar is the coin generally used in China, but in the interior block silver, cast in the form of a shoe and stamped to indicate its fineness, is commonly used, pieces of it being cut off and sold to the local banks for their equivalent in copper coin. Besides the Mexican dollar there is the so-called "chop" dollar—that is, a coin which is stamped with the monogram or chop of the issuing firm. In some parts of the country there are imitations of the Mexican dollar, but these do not pass current outside of the viceroyalty in which they are minted. The Haikwan tael is the coin used in the customs. Its value on October 1, 1899, was 71.8 cents in United States currency. The tael is merely the name of a weight, and there are twelve other varieties of taels, each differing from the other in value. They represent a Chinese ounce of silver, and the instability in their values results from the fluctuations of the silver bullion. The value of silver coins varies with the business demands in particular localities. When this demand rises the value increases, and when it sinks the value falls to that of the bullion which the coin contains. The fluctuations of silver and the lack of quick communication between markets lead to much confusion in the currency. Some of the banks issue paper currency based on Mexican dollars, and this currency varies in value in the different ports, according to the changes in the value of the silver which the notes represent. Thus, the depreciation of the bank-note may have nothing to do with the insolvency of the bank, but may result solely from the change in the market value of silver bullion. It is a matter of extreme difficulty for the European to determine the value of his gold in the chop dollars which are circulated at the ports. Different banks will give entirely different estimates of the value of gold coin in the ordinary circulating medium. The chief sufferers from this confusion in the currency system appear to be the wage-earning class, since the price of labor does not respond readily to changes in the price of commodities. For example, it was reported by one of the United States representatives in China in 1899 that a recent fall in the value of silver had raised the price of commodities 10 per cent., while wages remained stationary. Since China has for many years imported more than she exported, there has arisen a belief in certain quarters that she is gradually being stripped bare of her silver. This view is reinforced by the supposed drain upon Chinese currency, owing to the need of finding funds to make payments on the loans held abroad, to supply war materials, to support legations, etc. On the other hand, it should be remembered that a good deal of China's foreign trade is not included in the customs statistics, and that the latter do not comprise the income derived from the purchases of provisions and other necessities by foreign vessels touching at Chinese ports, or the amount of money sent to China by her emigrants abroad or brought back by returning emigrants. It has been estimated that \$10,000,000 or \$12,000,000 each year finds its way to China from California alone. In addition there are the sums expended by the various foreign legations and consulates in China and by travellers. All these things tend to offset the drain upon the currency from excess of imports which has occasioned this fear of national bankruptcy. In 1898, moreover, the net import of silver amounted to 4,722,025 Haikwan taels, and there was no evidence in the country that silver was becoming scarce. There was evidence, however, of a scarcity of the

copper cash as compared with that of silver. This has necessitated the minting of subsidiary silver coins in greater quantities.

The liabilities of China were greatly increased as a result of the war with Japan. In 1895 the Chinese government negotiated a loan with Russia and France for \$77,200,000, and later with England and Germany for \$155,728,000. Between 1887 and 1898 it was estimated that the money added to the circulation in China amounted to about £55,000,000. If payments are made at regular intervals, as proposed, the debt will be about \$194,600,000 in 1911. In 1899 the sum due was \$258,030,794.

HISTORY.

Anglo-Russian Agreement.—On April 28, the governments of Great Britain and Russia entered into an arrangement, in regard to China, at St. Petersburg. Its importance can be best appreciated by considering the status of the two powers in China. Russia, it will be remembered, had secured Port Arthur, the future terminus of the Trans-Siberian Railway, and had established her influence over all Manchuria. This region she regarded as in her sphere of influence—that is to say, she exercised it in an actual, though perhaps not an official, control under the guise of developing the railway system. She was now turning her attention toward the south, and apparently desired to expand in the direction of Peking. England, having given up her policy of maintaining the integrity of China, had entered into the general spirit of the new movement, and in the partition of China had tried to secure a good portion for herself. What she had obtained was a promise on the part of the imperial government that it would not alienate to any power any portion of the Yang-tse-Kiang valley, which is said to be the most beautiful and fertile portion of China. This region was in fact her sphere of influence, though it did not appear under that name. Down to the spring of 1899 England's sphere of influence was not recognized by Russia, nor Russia's by England. It was thought that this might occasion trouble in the future. In addition to this general necessity for an agreement, there was a special point of difference between the rival powers on the subject of the so-called Railway of the North, between Tientsin and Shanhai-Kwan, the latter being at the point where the Great Wall reaches the coast of the Gulf of Pechili. This railway had been constructed and was already in operation. The Chinese government, wishing to extend this line as far as New-Chwang, an important point on the Gulf of Liao-Tung, in the direction of Port Arthur, had contracted a loan with the English bank of Hong-Kong and Shanghai, which loan was to be secured by the receipts from the railway. The debate over this New-Chwang railway was carried on sharply during the year 1898, and at one time seemed to threaten serious consequences. One of its clauses, providing for the appointment of an English engineer and a European financial expert, who should have charge of the exploitation of the railway, was displeasing to the Russian government, which declared that it was violative of the engagements made between China and Russia in that it established a species of control on the part of a European power to the north of the Great Wall. On the other hand England held the Chinese government to its engagement with the Bank of Hong-Kong and Shanghai. The arrangement of April 28 had to do with both the general questions of spheres of influence and with this specific difficulty over the New-Chwang contract. In regard to the former matter the two powers declared that they were animated by a sincere desire of avoiding in China every cause of conflict, and that, taking into consideration the economic and geographical condition of certain parts of the empire, they had agreed upon the following arrangement: Russia was not to demand railway concessions in the basin of the Yang-tse, and was not to oppose the demands for concessions in that region on the part of England. England, on her side, made the same engagement in regard to the portion of China lying north of the Great Wall. Thus, it is a reciprocal recognition on the part of England and Russia of their respective spheres of influence in China, but the words spheres of influence did not occur, the expression of spheres of concessions and of exploitation of railways being used instead. An assurance was given that the two powers had no intention of encroaching upon the sovereign rights of China or upon existing treaties. As to the New-Chwang railway England carried her point in that the Chinese government was empowered to nominate an English engineer and a European accountant, but it is understood that this fact shall not establish a right of property or foreign control and that the line shall remain Chinese and under the control of the Chinese government, and shall not be leased by or alienated to any company that is not Chinese. The arrangement was well received at London, since it seemed to insure to England the sphere of the Yang-tse as well as to safeguard the interests of the English subscribers to the loan of the Hong-Kong and Shanghai bank. This satisfaction was diminished a few days later when the news came from Peking that Russia demanded from the Chinese government the right to construct a new line which should unite Peking with the Russian railway of Manchuria. Two routes were men-

tioned, the one starting from Peking and extending in a straight line northward, the other running to the northeast in the direction of Shanhai-Kwan, New-Chwang, and Port Arthur. It looked like the extension of Russian influence to Peking, and if the second route were adopted it could hardly fail to cause economic injury to the New-Chwang line constructed by the English, since it would run parallel to that line and take its traffic. Still more serious was the suspicion that Russia, in extending her influence to the south of Peking, was encroaching upon the Yang-tse. Protests accordingly followed from London. Technically there was nothing in the attitude of Russia that was contrary to the arrangement of April 28, since no portion of that convention prohibited the construction of the projected line, and nothing in it declared that Russia's influence should be confined to the country north of the Great Wall. The English position was that in having recognized the influence of Russia only to the north of the Great Wall she reserved for herself the right to oppose that influence in the south. It was evidently the hope of the English that the country between their sphere and that of Russia would be a sort of neutral ground or buffer.

The Italian Claim.—In 1899 the Italian government, with the approval of Great Britain and Japan, attempted to secure a concession at San Mun Bay, on the coast of the province of Che-kiang. The other powers acquiesced in this policy of Italy's, but Russia was said to be opposed. The Italian demand was for the harbor of San Mun, with the surrounding district, at a radius of about the same length as that which measured the German concession at Kiaochow, and it also included three islands off the coast, and, in general, the same terms as the Germans had received, comprising preferential railway and mining rights and the permission to construct a railway line from the coast to Po-yang Lake. It also included the recognition of an Italian sphere of influence over two-thirds of the province of Che-kiang. The Chinese foreign office refused the demand in rather sharp terms, owing to the fact that through some mistake the Italian minister had presented the demand in the form of an ultimatum. Upon the explanation of the mistake the Chinese authorities apologized for the tone of their refusal, but did not withdraw the refusal itself. For a time the matter was in doubt. It occasioned some sharp discussion in the Italian parliament. It was finally reported, however, that the demand was withdrawn and an earlier demand for mining and railway concessions was pressed in its stead. See ITALY (paragraphs on History).

England and the Open Door.—In June, 1899, the Chinese policy of the government was sharply criticised by Lord Beresford, who said that while the ministry had constantly declared themselves in favor of the policy of the "open door," they had all along been moving in the direction of "spheres of influence." The reply of the government was that they had not abandoned the former policy or adopted the latter. They were not, however, prepared to go to all lengths in maintaining the integrity of the Chinese empire. They were aiming rather at securing for Great Britain its full share of the advantages to be had from the opening up of China. British concessionaries had already received grants for 2800 miles of railway, and they also had acquired their full share of mining privileges. The government could not see its way to incurring the responsibility of the internal government of China, but it declared its intention of protecting and maintaining the interests of British trade. Its aim was to secure the free transit of trade under passes, its exemption from the *likin* tax, and from all undue taxation, and the effectual opening up of the inland waters to navigation and of new ports of trade. They intended to hold the Chinese government to the non-alienation of the Yang-tse region, and to the right of British investors to construct a railway between Burmah and the Yang-tse. Not a monopoly of rights, but a fair share was the aim of the British government, and among the instances cited of the success of this policy were the agreement for a line from Tientsin to Ching-kiang, which would lie partly within the German sphere of influence and partly in the British, the Germans to construct their portion of the line and the British theirs, and the agreement with France that whatever concessions should be made in the provinces bordering on Tonquin the trade of other powers should not be excluded from that region. The government showed a willingness to compromise, but it aimed at making a good bargain. It declared that if the occasion arose it would advise the Chinese government not to permit the transfer of the central government at Peking to any other power. This, in general, was the tone of the government's reply to the criticism of the opposition and to questions in respect to the policy toward China. A large part of the opposition demanded that the government should take prompt and effective measures to insure the Chinese government in its independence. But the ministry could not be induced to guarantee directly the integrity of the Chinese empire. In regard to Wei-hai-wei the government announced that it intended to make this port the chief naval base for the eastern squadron. It was said to be the best deep-water harbor on the Chinese coast, and one of the most healthful stations in that part of the world.

The government proposed to make it a secondary naval base and provide it with sufficient fortifications to protect itself against a raid. A naval hospital was to be established there.

Other Events of the Year.—A revolt which threw parts of the interior into confusion during the year 1898 continued in 1899. Before the close of 1898 the rebels of Sze-chuen took a French missionary prisoner, and the French government sent an ultimatum to the Chinese government that unless the missionary was released in ten days French troops would cross the border. The imperial government in reply requested a further delay, and this was granted. During the early part of 1899 the revolt made considerable headway, and there were reports that several cities had been captured by the rebels and that many atrocities had been committed; but in February the imperial troops gained further successes and inflicted heavy losses on the insurgents. The distress caused by the floods of the Yellow River was still acute in 1899, and upon the report of Li Hung Chang the government appropriated money for building dykes and making other improvements in order to prevent similar disasters in the future. In 1899 there were frequent reports of race conflicts of a minor nature. On February 19 it was reported that a riot had occurred between the Chinese and Russians at Talién-wan and that three hundred Chinese were killed. In August what threatened to be a serious conflict arose at Hankow between the British and the Russians over a question of land ownership. A certain piece of land which was included in the Russian concession had been purchased by a British firm many years before. The British owner having sent workmen to fence in his property, the latter were set upon by a body of Russians and driven off. Thereupon a force of marines from a British gunboat landed and mounted guard over the property. Toward the close of August, however, the diplomatic representative of Great Britain and of Russia signed an agreement referring the matter to arbitration. The repeated disturbances at Kiao-chau, arising out of Chinese hatred for the Germans, led the German government in August to give formal warning that unless these troubles ceased a military occupation of the ceded territory would follow in order to guarantee security of life and property. The United States government had its share in the common experience of the weakness or unscrupulousness of the imperial government of China in the matter of fulfilling its obligations. The Hankow-Canton railway concession, as has been stated in a previous paragraph, was an American enterprise, involving not only the construction of a railway, but concessions for the mining of coal and other minerals. In the course of the year there was evidence that the Chinese government was trying to evade its agreement with the American-Chinese Development Company, which was the name of the syndicate that obtained these concessions, and the United States government made the matter the subject of diplomatic negotiation.

CHINIQUEY, Rev. CHARLES PASCHAL TELESPORE, died in Montreal, Quebec, January 16, 1899. He was born at Kamouraska, Quebec, July 30, 1809; was ordained to the Roman Catholic priesthood in September, 1833, and three years later was appointed curate of Beaufort. Here he began so vigorous a work against the liquor traffic that later he became known as the "Apostle of Temperance;" he was given a vote of thanks and a purse of £500 from the Canadian Parliament and received the benediction of the Pope. In 1852 he founded a colony of about 5000 French-Canadian Roman Catholics at St. Anne, Kankakee County, Ill. Not long after he became involved in disputes with his superiors in the church; these troubles led to legal action, and in 1856 Father Chiniquy was successfully defended by Abraham Lincoln. He had already experienced a change of view in various matters of doctrine; in 1858, along with almost all of the inhabitants of St. Anne, he withdrew from the church. On the 15th of April, 1860, the Presbytery of Chicago held a meeting at St. Anne, and Mr. Chiniquy and nearly 2000 of his followers were received into the Presbyterian communion. For many years he was an active minister in this church, and by his lectures he became well known throughout the United States, England, and the Australian colonies. He was a prolific writer. Among his publications are: *The Manual of Temperance; Fifty Years in the Church of Rome; Papal Idolatry; The Priest, the Woman, and the Confessional; Rome and Education; The Perversion of Dr. Newman to the Church of Rome.* Mr. Chiniquy died in the Protestant faith.

CHITTY, Sir JOSEPH WILLIAM, K.B., a lord justice of the Court of Appeal, died February 15, 1899. He was born in 1828; was educated at Eton and at Balliol College, Oxford, and in 1852 was appointed a fellow of Exeter College, Oxford. He became a barrister in 1856, Queen's counsel in 1874, and was judge in the chancery division of the High Court of Justice from 1881 to 1897. In the latter year he became a privy councillor and was made a lord justice of the Court of Appeal. In 1880-81 he represented Oxford in Parliament.

CHLORETON. A new drug that has been tested systematically during 1899 is

trichlor-tertiary-butyl-alcohol, or chloreton. It is a hypnotic and anæsthetic. As a hypnotic it is found to be useful, especially in the insomnia of the aged and in heart disease with high arterial tension complicating kidney disease. It is useful as a local anæsthetic in the case of wounds, burns, and ulcers. It has been suggested as a possibility that it may be administered internally in seasickness and other cases in which vomiting occurs. It does not irritate the stomach or cause unpleasant sequels, with the sole exception of drowsiness on the day following the use of a large dose.

CHOATE, JOSEPH HODGES, a prominent New York lawyer, was nominated by President McKinley on January 11, 1899, to be ambassador to Great Britain, to succeed Colonel John Hay, who had resigned to accept the portfolio of state in the Cabinet. The nomination was confirmed by the Senate on the 19th of January. Mr. Choate was born in Salem, Mass., January 24, 1832; he was graduated at Harvard in 1852 and at the Dane Law School two years later. In 1856 he settled in New York City, where he has reached the foremost rank in the legal profession. Not only, however, has he gained prominence as lawyer, but as an able orator and ready after-dinner speaker. His appointment to the embassy at the Court of St. James was widely approved, and his first year's work in diplomacy was successful in itself and satisfactory to his countrymen.

CHOLERA INFANTUM. See VITAL STATISTICS.

CHRISTIAN AND MISSIONARY ALLIANCE, formed in 1897, has as subordinate branches the Berachah Home and Berachah Orphanages, the Institute for the Training of Home Workers, and the Missionary Training Institute. President, Rev. A. B. Simpson, 690 Eighth Avenue, New York City; secretary, A. E. Funk.

CHRISTIAN ENDEAVOR, UNITED SOCIETY OF, founded in Portland, Me., in 1881 for the training of young people for the duties of church membership. In 1899 there were in the United States and Canada, Great Britain, Australia, China, India, and Japan, 56,280 societies, with a membership of 3,376,800. Membership is distributed in all evangelical denominations. The United Society is a bureau of information for all the individual societies. President, Rev. Francis E. Clark, D.D., the founder of the society; general secretary, John Willis Baer. An international convention is to be held in London, July 14-18, 1900.

CHRISTIANS, THE, a religious sect of the United States, comprise the Christian Connection and the Christian Church (South). They report for 1899 much progress in missionary, financial, and educational lines, but their membership shows a decrease. In 1899 they had 1452 ministers, 1505 churches, and 112,414 members. The term Christians is applied also to the Disciples of Christ (*q. v.*). The latest report (1899) of the commissioner of education credits the Christians with 17 institutions of learning, 147 professors, 1492 students, and endowment funds aggregating \$818,309.

CHRISTIAN SCIENTISTS (more properly called the Church of Christ, Scientist) are a sect of professing Christians, whose peculiar form of the Christian religion was originated in 1866 by Mary Baker G. Eddy, the author of *Science and Health, with Key to the Scriptures*. Its chief tenets are that Christ's mission in this world was to heal the sick as well as to save the souls of men, and that, in Mrs. Eddy's words, "*Disease is more than imagination; it is a human error, a constituent part of what comprise the whole of mortal existence—namely, material sensation and mental delusion. But an erring sense of existence, or the error of belief, named disease, never made sickness a stubborn reality.*" In some of their unsuccessful efforts to cure disease without medicine they have attracted much attention and no little opprobrium. Whatever may be said for or against them, the doctrines of Christian Scientists are spreading. Their spread may be seen not only in the United States and Canada, but in Great Britain, Germany, France, Norway, Sweden, Bulgaria, South Africa, Australia, China, Japan, and Hawaii. In 1899 the Christian Scientists had 402 chartered churches, an increase of 98 over 1898, and 111 regularly established Sunday services, which when further organized form new churches. There were some 50 church buildings and 102 public reading-rooms for the propagation of the doctrines, an increase of 17 over 1898. The great text-book of the system, mentioned above, reached its 178th edition in 1899, the first having been published in 1875. The First Church of Christ, Scientist, in Boston, Mass., known as the Mother Church, had in 1899 a local membership of 1500 and a so-called general membership of 16,000, or an increase of over 4000 during the year. The whole number of church members in the world is placed at 90,000, an increase of about 20,000, and the avowed adherents are said to number about 500,000. A Christian Science Board of Education was founded in 1898, which, directed by the Massachusetts Metaphysical College of Boston, selects teachers for systematic education in the religion, healing, and obstetrics of the system. There are 62 established institutes in the United States

and Canada. The Christian Scientists now publish a monthly and a weekly periodical. The active ministry, composed of official church readers, teachers, mission workers, practitioners, and lecturers, was in 1899 about 12,000; and the attendance in Christian Science churches is said to have doubled in that year. Forty church edifices were in course of construction, two of them in New York City, to cost an aggregate of \$700,000. A strong effort is being made by the regular medical practitioners in various parts of the country to get legislation against the Christian Science healers, but has failed in many States on the ground that the healers, not employing drugs, cannot be said to practise medicine. An opinion handed down by Judge Bosworth, of the Supreme Court of Rhode Island, voices the attitude of a number of the members of the bench regarding Christian Science. The case was one on appeal, and the higher court reversed the findings of the lower. Judge Bosworth says: "While it is true that the study and treatment of mental disease constitute one of the departments or branches of medicine, in which the influence of the mind over the body is recognized, yet mere words of encouragement, prayer for divine assistance, or the teaching of Christian Science, as testified, in the opinion of the court does not constitute the practice of medicine in either of its branches, in the statutory or popular sense." And regarding the powers of the State Board of Health to pass upon qualifications of applicants for the certificate licensing them to practise medicine, he adds: "The board cannot determine which school or system of medicine in its theories and practice is right. It can only determine whether the applicant possesses the statutory qualifications to practise in accordance with the recognized theories of a particular school or system." It may be added that decisions in favor of Christian Scientists have been reached in the courts of Ohio, Minnesota, and Oklahoma; and that attempts to legislate against them were unsuccessful in New York, Minnesota, Colorado, Maine, and Rhode Island.

It is generally acknowledged that in many diseases the mind can play an important curative rôle in allaying symptoms and permitting the spontaneous remedial activities of the human system to operate. For the attitude of psychologists toward this power of mind over body see the article SUGGESTION, in which it is stated that suggestion is the essential element common to Christian Science healing, mind cure, faith cure, psycho-therapeutics, hypnotism, and other forms of cure without the use, or with an ineffectual use, of drugs. The present attitude of the world at large toward Christian Science was characteristically voiced at the June (1899) meeting of the Medico-Legal Society of New York. The arguments against Christian Science and in favor of some legislation restraining Christian Scientists from practising their art of healing, on the one hand, were heard, and the defence of Christian Science by Carol Norton, C.S.D., and John Carroll Lathrop, C.S.B., were listened to. It was pointed out that while religious freedom is permitted by the United States constitution, it is a menace to public health to allow any sect to endanger their lives and the lives of others by refusing regular medical aid and ignoring the usual means of preventing the spread of zymotic diseases. The defence of the Christian Scientists, on the other hand, does not notice this point, but calls attention to the injustice of enforcing any individual to call, in case of sickness of himself or any member of his family, a physician of any one school, thus claiming recognition as a school of medical practice on equal terms with the regular, homœopathic, and other schools of medicine. Again, the Christian Scientists say that they should no more be judged by their failures to cure diseases in individual cases than regularly accepted physicians, and they make a strong claim that their failures are no greater a percentage of the total number of cases than those of regular medical practitioners. The Christian Science religion is so closely connected with their healing art that it has brought them to the extreme position of not only declining to call a regular physician, but refusing to take his medicine. It would seem that the Christian Science tenet that disease is unreal and non-existent would not prohibit them from taking any drugs recommended by regular physicians, as their belief in the sovereign remedial agency of the soul should cause them to think that whatever medicine they took could have no effect whatever.

The following books on Christian Science have appeared during the year 1899: J. M. Buckley, *Christian Science and Other Superstitions* (New York); L. A. Crandall, *Some Facts Concerning Christian Science* (Chicago); Annie Harwood, *An English View of Christian Science: An Exposure* (New York); Willard H. Hinkley, *Modern Theosophy, Christian Science, and Spiritism* (Boston); H. Varley, *Christian Science Examined* (New York); Rev. W. Short, *Christian Science, What it is, What is New and What is True about it* (New York).

CHROMIC IRON ORE. The production of chromic iron ore in California, which has been practically the only domestic source, almost ceased in 1897, and the 1898 supply came almost entirely from Asia Minor. It amounted to 16,304 long tons, valued at \$272,244. Chromite is used to some extent in California as a basic refractory lining for furnaces.

CHURCHILL, LADY RANDOLPH (Jennie Jerome), the daughter of the late Leonard Jerome, of New York, was born in Brooklyn about 1854. She was educated chiefly in France, and in 1874 was married to Lord Randolph Henry Spencer Churchill, third son of the seventh Duke of Marlborough, who died in 1895. Lady Randolph Churchill is vice-president of the Ladies' Grand Council, Primrose League of England. In 1899 she established the *Anglo-Saxon Review*, of which she is editor. In this year she was also instrumental in organizing a fund for the American hospital ship *Maine*, for service in South Africa. She went in this ship to South Africa on the news of the capture of her son, Lieutenant Winston Spencer Churchill, by the Boers.

CHURCHILL, WINSTON, author, was born in St. Louis, Mo., November 10, 1871; he was graduated from the United States Naval Academy at Annapolis in 1894, and married Mabel H. Hall, of St. Louis, October 22, 1895. In 1894 he was one of the editors of the *Army and Navy Journal*, New York, and in 1895 managing editor of the *Cosmopolitan Magazine*. He is a hard worker, painstaking and conscientious. Besides various naval stories that have appeared in the magazine, he has published *The Celebrity* (1898) and *Richard Carvel*, one of the most popular novels of 1899.

CHURCHILL, WINSTON LEONARD SPENCER, son of the Rt. Hon. Lord Randolph Churchill, was born on November 30, 1874. He was educated at Harrow and Sandhurst and entered the army in 1895, in which year he served with the Spanish forces in Cuba and received the Order of Military Merit. In 1897 he served with the Thirty-first Punjaub Infantry, was mentioned in despatches, and received a medal with clasp for his actions at Bajaur. He also served as orderly officer to Sir W. Lockhart with the Tirah Expeditionary Force in 1898, and was with the Twenty-first Lancers in the Nile Expeditionary Force, and for his services at the battle of Khartoum received a medal with clasp. In 1899 he contested Oldham (Conservative), and in 1899 went to the Transvaal. He was taken prisoner by the Boers, with others, in the armored train near Estcourt, November 15, while acting as war correspondent of the *Morning Post*.

CHURCH OF CHRIST, SCIENTIST. See CHRISTIAN SCIENTISTS.

CHURCH OF IRELAND, united to the Church of England in 1800, but disestablished in 1871. The government is by general synod, composed of two houses of representatives, of the bishops, the clergy, and the laity. In 1899 there were 13 bishops, 1200 incumbents, 360 curates, and an estimated church population of 600,700.

CHURCH TEMPERANCE SOCIETY, of the Protestant Episcopal Church, organized in 1881 for the promotion of temperance, has the Church Temperance Legion, an organization of boys' and young men's temperance clubs, maintains six lunch wagons, which supplied 290,475 ten-cent meals during 1899, ten iced-water fountains, coachmen's coffee wagons, and the Squirrel Inn, on the Bowery, New York City. President, the Right Rev. Thomas M. Clark, bishop of Rhode Island; secretary, Robert Graham, 281 Fourth Avenue, New York City.

CLILEY, Professor BRADBURY LONGFELLOW, died at Exeter, New Hampshire, March 31, 1899. He was born at Nottingham, New Hampshire, in 1838. He was graduated at Harvard with the class of 1858. For forty years he was professor of Greek at Phillips Exeter Academy.

CONCINNATI, SOCIETY OF THE, founded in 1783, "to perpetuate as well the remembrance of this vast event (the Revolutionary War) as the mutual friendships which have been formed under the pressure of common danger, etc.," is composed of the general society and the state societies. The next triennial meeting of the general society will be held in Hartford, Conn., in May, 1902. President of the general society, Hon. William Wayne, Pennsylvania; secretary, Hon. Asa Bird Gardiner, Rhode Island. Offices, Garden City, L. I. There are state societies in active membership in Massachusetts, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, South Carolina, and Virginia.

CIVIL ENGINEERS, AMERICAN SOCIETY OF, founded in 1852, had in 1899 a membership of 2227. General meeting for 1900 at London, England, June 2-7. The society publishes *Proceedings* (ten months in the year) and semi-annual *Transactions*. President, John F. Wallace; secretary, Charles Warren Hunt, 220 West Fifty-seventh Street, New York City.

CIVIL SERVICE REFORM. See UNITED STATES.

CLAPP, ALEXANDER HUNTINGTON, D.D., well-known Congregational clergyman, died in New York, April 27, 1899. He was born at Worthington, Mass., September 1, 1818. He studied at Phillips Academy, Andover; was graduated at Yale in 1842, and at the Andover Theological Seminary in 1845. Entering the Congregational ministry, he preached in Brattleboro, Vt., from 1846 to 1853, and in

Providence, R. I., from 1855-1865. From the latter year to 1878 he was secretary of the American Home Missionary Society; for a number of years he also acted as its treasurer, and later became editor of *The Home Missionary*, the official organ of the society. From 1875 to 1895 Dr. Clapp was the New York editor of the *Boston Congregationalist*. He edited *Lives of the Presidents* and other works.

CLARK CELL. See PHYSICS.

CLARK, WILLIAM ANDREWS, United States Senator from Montana, was elected, as a Democrat, by the legislature on January 28, 1899, eleven Republican members voting for him, to succeed Senator Lee Mantle, Silver. He is a millionaire capitalist, and it was alleged that the election was effected by extensive bribery in the legislature. An investigation of the matter was instituted after Congress convened, and was referred to the Senate committee on privileges and elections, but at the close of 1899 no decision had been rendered. Mr. Clark was vigorously opposed in his election by Mr. Marcus Daly, the Anaconda mining capitalist. Born near Connellsville, Penn., January 8, 1839, Mr. Clark received an academic education and studied law at Mount Pleasant (Iowa) University, but never entered the legal profession. In 1859-60 he taught school in Missouri, removed to Colorado in 1862, and to Montana in the following year. Since that time he has been engaged in mercantile business, banking, mining, and manufacturing, and has come into possession of large interests. He is the proprietor of the *Miner* newspaper, and owns the tramways of Butte. At the Centennial Exposition in Philadelphia he represented Montana as orator for the territory. As major he led the Butte battalion in the Nez Percé campaign of 1878. In 1884 he served as commissioner from Montana to the New Orleans exposition, and in 1884 and 1889 was chairman of the Montana constitutional conventions. He was the Democratic nominee for United States Senator in 1890, and claimed the election, but was not seated.

CLARKE, JOHN SLEEPER, a famous comedian, died in London, September 25, 1899. He was born in Baltimore, Md., September 3, 1833. He made his début in Boston in 1851, and the next year appeared in comic rôles at the Chestnut Street Theatre, Philadelphia; his first appearance in New York was in 1861. Clarke rose to the first rank of comedians and also became well known as a theatre manager. For a time he was a partner of William Wheatley in the management of theatres in Baltimore and Philadelphia; from 1864 to 1867 he was a lessee with his brother-in-law, Edwin Booth, of theatres in New York, Philadelphia, and Boston. In the latter year Clarke went to England, where he thereafter resided. He did not relinquish, however, at that time his theatre holdings in this country, and it was not until 1887 that he disposed of his Philadelphia property. In London he was for a time joint manager with the late E. A. Sothorn of the Haymarket Theatre, and for many years before his death he was owner of the historic Strand Theatre. Clarke appeared on the American stage repeatedly between 1870 and 1881. Among his rôles once famous but now perhaps almost forgotten were: Dr. Pangloss in *The Heir at Law*; Major de Boots in *A Widow Hunt*; Farmer Ashfield in *Speed the Plough*; Tyke in *The School of Reform*; Timothy Toodle in *The Toodles*.

CLARKE, ROBERT, a Cincinnati publisher, died at his home in Glendale, O., August 26, 1899. He was born in Dumfriesshire, Scotland, May 1, 1829; in 1840 he removed with his parents to Cincinnati, and he was educated at Woolward College in that city. He entered the book trade, and afterward changed to the publishing business, in which he achieved a marked success. At the time of his death he was president of the publishing and bookselling house known as The Robert Clarke Company. Clarke has issued many volumes relating to the early history of the Northwest Territory and to the Civil War. Of his own writings there have been published articles on archaeological and historical subjects. He edited *Pioneer Biographies* and Colonel George Roger Clarke's *Campaign in the Illinois*. Clarke was a fellow of the American Society for the Advancement of Science.

CLARY and ALDRINGEN, CARLOS, COUNT VON, premier of Austria, succeeded Count von Thun-Hohenstein in this position, and formed a ministry on October 2, 1899. The ministry of Count von Thun-Hohenstein lasted from March 7, 1898, to September 3, 1899, when it resigned. Count von Clary is the head of a noble and ancient Austrian family, and was born in Vienna on April 3, 1844. He succeeded to the estates on the death of his father, Count Edmund Moritz, June 21, 1894. He is a privy councillor and a hereditary member of the upper house of the Austrian government. For an account of the Clary ministry, see AUSTRIA-HUNGARY (paragraphs on History).

CLAY. The production in the United States during the year 1898 was unprecedented, and exceeded that of 1897 by over \$9,000,000. The statistics for the year are as follows:

Variety.	1897.	1898.
Common brick.....	26,430,207	29,961,992
Pressed brick.....	3,855,033	3,495,697
Paving brick.....	3,582,037	3,922,642
Fancy bricks.....	685,048	632,165
Firebricks.....	4,094,704	5,579,761
Drain tiles.....	2,623,305	3,026,213
Sewer pipe.....	4,069,534	3,651,206
Terra-cotta.....	1,841,422	1,979,825
Fireproof.....	1,979,259	1,846,092
Tile, not drain.....	1,476,638	1,731,024
Miscellaneous.....	1,413,595	1,818,089
Pottery.....	10,309,209	13,952,674

Ohio ranked first among the clay-producing States, followed by New Jersey, Illinois, New York, and Pennsylvania. The imports of clay products in 1898 amounted to \$755,268. Among the important publications bearing on this subject issued during the past year is a report on the clays of Georgia by G. E. Ladd, *Bulletin of the Georgia Geological Survey*; the manufacture and the use of paving brick in the middle West, H. F. Bain, *Mineral Industry*, Vol. VII., page 135.

CLEMENT, NATHANIEL H., ex-justice of the New York State Supreme Court, was born at Tilton, N. H., March 23, 1844; died in Brooklyn, N. Y., March 3, 1899. After his graduation from Dartmouth College in 1863 he served for a short time with the cavalry in the Civil War. During the latter part of the war he was a clerk in the treasury and war departments. Subsequently he removed to Brooklyn, studied law, and in 1882 was made a judge of the city court, and its chief justice in 1887. Upon the abolition of this court in 1894 he was elevated to the supreme bench. His term expired in 1896.

OLIFDEN, Fifth Viscount, LEOPOLD GEORGE FREDERICK AGAR-ELLIS, M.A., died September 10, 1899. Born May 13, 1829, and educated at Trinity College, Cambridge, he became in 1856 aide-de-camp to Earl Carlisle, lord-lieutenant of Ireland, continuing to 1864. He sat in Parliament for Kilkenny from 1857 to 1874, and in 1886 represented East Hampshire as a Liberal. His heir was Baron Robartes.

CLIMATOLOGICAL ASSOCIATION, AMERICAN, held its sixteenth annual meeting in New York City, May 9-11, 1899. The president, Dr. Beverley Johnson, in his opening address declared his belief that in the near future the physician would become more than ever before the counsel and guide in all matters affecting the public health. Officers elected: President, Abraham Jacobi, M.D., New York City; secretary, Guy Hinsdale, M.D., Philadelphia, Penn.

COAL. The production of coal in the United States in 1898 amounted to 219,974,667 tons, which is the largest production on record, and which exceeded that of 1897 by nearly 10 per cent. About 75 per cent. of this output came from the Appalachian coal region. The production was distributed as follows, the figures being those issued by the United States Geological Survey:

COAL PRODUCT OF THE UNITED STATES IN 1898, BY STATES.

STATE.	Number of mines.	Loaded at mines for shipment.	Sold to local trade and used by employees.	Used at mines for steam and heat.	Made into coke.	Total production.	Total value.	Average price per ton.	Average number of days active.	Average number of employees.
		Short tons.	Short tons.	Short tons.	Short tons.	Short tons.				
Alabama.....	82	4,926,828	107,576	145,808	1,355,071	6,535,283	\$4,932,776	\$0.75	250	10,733
Arkansas.....	17	1,167,103	13,256	25,139	.....	1,205,479	1,228,778	1.03	163	2,555
California and Alaska...	7	135,568	19,996	4,724	.....	160,288	405,915	2.53	265	314
Colorado.....	101	3,132,976	130,905	117,829	695,546	4,076,347	4,696,081	1.15	220	6,440
Georgia and North Carolina.....	3	145,778	1,194	6,089	101,721	255,682	212,537	.83	292	534
Idaho.....	2	.....	1,039	.....	.....	1,039	2,675	2.57	157	7
Illinois.....	329	15,596,888	2,149,608	852,603	.....	18,599,299	14,567,598	.78	175	35,026
Indiana.....	141	4,396,078	367,790	130,810	4,065	4,930,743	3,994,918	.81	199	8,971
Indian Territory.....	22	1,810,178	16,632	34,053	20,601	1,881,466	1,827,638	1.32	198	3,216
Iowa.....	187	3,981,362	572,063	65,417	.....	4,618,842	5,260,716	1.14	219	10,282

COAL PRODUCT OF THE UNITED STATES IN 1898, BY STATES.—Continued.

STATE.	Number of mines.	Loaded at mines for shipment.	Sold to local trade and used by employees.	Used at mines for steam and heat.	Made into coke.	Total production.	Total value.	Average price per ton.	Average number of days active.	Average number of employees.
		<i>Short tons.</i>	<i>Short tons.</i>	<i>Short tons.</i>	<i>Short tons.</i>	<i>Short tons.</i>				
Kansas.....	110	8,079,601	277,022	49,932		8,406,555	3,703,014	1.09	194	7,197
Kentucky.....	116	8,537,429	253,629	55,206	41,644	8,887,908	3,084,551	.79	187	7,614
Maryland.....	31	4,618,990	30,941	18,953		4,674,884	3,532,257	.76	253	4,818
Michigan.....	17	232,155	75,622	7,945		315,722	402,711	1.47	245	715
Missouri.....	194	3,393,815	249,662	45,344		3,688,821	2,871,296	1.07	198	6,542
Montana.....	26	1,261,814	29,493	19,390	169,110	1,479,803	2,324,207	1.57	216	2,359
New Mexico.....	16	949,908	7,660	17,601	17,124	992,288	1,344,750	1.35	242	1,673
North Dakota.....	18	71,223	11,525	1,147		83,895	93,591	1.12	187	151
Ohio.....	431	18,053,427	1,226,184	222,913	14,343	14,516,867	12,027,336	.83	169	26,986
Oregon.....	5	54,905	3,290	589		58,184	212,184	3.65	142	199
Pennsylvania.....	699	48,019,561	1,520,750	732,984	14,891,838	65,165,133	43,352,588	.67	229	79,611
Tennessee.....	51	2,199,075	37,971	52,523	733,327	3,022,896	2,337,512	.77	234	6,643
Texas.....	16	678,732	3,247	4,755		686,734	1,139,763	1.66	245	2,130
Utah.....	30	435,716	11,542	9,845	86,006	593,709	752,252	1.27	243	739
Virginia.....	30	1,029,185	19,564	16,294	750,291	1,815,274	1,070,417	.59	230	1,955
Washington.....	23	1,748,411	30,636	56,966	48,558	1,884,571	3,352,798	1.78	270	3,145
West Virginia.....	225	12,965,903	471,796	61,176	3,302,124	16,700,999	10,131,264	.61	218	21,907
Wyoming.....	23	2,696,326	31,655	108,447	35,384	2,863,812	3,664,190	1.28	242	3,475
Total bituminous...	2,862	133,871,530	7,667,848	2,865,292	22,167,353	166,592,023	132,586,313	.80	211	255,717
Pennsylvania anthracite.	840	47,068,561	1,226,066	5,055,997		53,382,644	75,414,537	1.41	132	145,504
Grand total.....	3,802	180,960,111	8,925,914	7,921,289	22,167,353	219,974,667	208,000,850	.85	190	401,221

The estimated production for 1899 is 56,697,525 short tons of anthracite, and 187,843,750 short tons bituminous. There have been no notable discoveries of new fields in 1899, but there has been a general increase in production all over the country, which has been aided by the absence of any large strikes.

The theory has been brought forward by Gresley that a large proportion of coal is made up of tiny rod-like forms of plant origin, which are composed chiefly of pitchy matter. He also considers that the presence of thin shaly seams found in coal is due to the fact that whenever organic matter which gives rise to coal-beds is washed into the waters where it has accumulated it is mixed up with more or less fine mud, and that, owing to the rapid settling of the vegetable matter and the slower settling of the suspended clay, the latter is deposited upon the former, thereby forming a thin layer.

The question of coal supply in the Far East is becoming interesting in view of the present struggle going on between the European powers. Great Britain and Japan at present control most of the good supplies, although the Dutch obtain much good coal from their own possessions. The Philippines after exploration will doubtless yield good fuel. Jordan, in treating of the mining industry of Japan, states that coal production leads. The coal is of tertiary age, and is used locally and exported. Simmersbach gives the following necessary requirements for good coke for metallurgical purposes: (1) Not over 4 per cent. of water; (2) not over 9 per cent. of ash; (3) not over 1 per cent. of sulphur; (4) not over 18 per cent. of phosphorus; (5) not over 6 per cent. of fine coke in any shipment; (6) a crushing strength of at least 1140 pounds per square inch. Among the books issued during 1899 is one on *The Chemistry of Coke*, by W. C. Anderson.

The following table gives the production of coal in other countries, the figures being for the latest year for which statistics are available (*Jour. Iron and Steel Inst.*, 1899, I):

Country.	Year.	Production in Tons.
Australia.....		
New South Wales.....	1897	4,383,591
New Zealand.....	1897	840,713
Queensland.....	1897	358,407
Tasmania.....	1897	48,501
Victoria.....	1897	236,277

Country.	Year.	Production in Tons.
Austria, coal.....	1897	10,492,771
" lignite	1897	20,458,093
Hungary, coal.....	1897	1,118,025
" lignite	1897	3,870,530
Belgium	1898	22,075,093
Borneo	1897	41,587
Canada	1898	3,725,585
Cape Colony.....	1897	113,851
France	1898	32,439,786
Germany, coal.....	1898	96,279,992
" lignite	1898	31,648,498
Holland	1896	137,787
India	1897	4,063,127
Italy, lignite.....	1897	314,222
Japan	1896	5,249,916
Mexico	1896	253,104
Natal	1897	243,963
Peru	1892	2,000
Portugal, anthracite.....	1897	7,996
" lignite	1897	9,342
Russia	1898	10,250,000
Servia	1896	11,726
South African Republic.....	1898	1,953,026
Spain	1898	2,466,800
Sweden	1897	224,343
United Kingdom.....	1898	202,042,243

COATS, JOSEPH, M.D., editor of the *Glasgow Medical Journal*, died January 23, 1899. He was born at Paisley, Scotland, February 4, 1846, and was educated at the universities of Glasgow, Leipzig, and Würzburg. In 1876 he became president of the Pathological Society and of the Medico-Chirurgical Society in 1891. He accepted the editorship of the *Glasgow Medical Journal* in 1878 and the professorship of pathology in the University of Glasgow in 1894, both of which positions he retained to the time of his death. Among his writings are: *A Manual of Pathology*, 1883, and *Lectures on Tuberculosis of the Lungs*, 1888.

COBALT. The domestic production of cobalt oxide in 1898 came from Mine la Motte, Mo., and amounted to 6247 pounds, valued at \$11,772. The production was nearly 70 per cent. smaller than that of 1897, but the price per pound slightly higher. The amount of cobalt oxide imported to the United States in 1898 was 33,738 pounds.

COCHIN CHINA is a name now applied to the French colony on the southern extremity of the eastern portion of the Indo-Chinese peninsula. The name was formerly identified with and is still loosely applied to the former empire of Anam, which included three distinct regions—namely, Lower Cochin China (now the French colony, Cochin China), Upper Cochin China (now the French protectorate, Anam proper), and Tonquin. The present French possessions in these regions are now, with the adjoining French protectorate Cambodia, which was partly in the Anamese empire also, grouped under the name of Indo-China. For an account of these possessions see COCHIN CHINA, LOWER; ANAM; TONQUIN; and CAMBODIA. See, also, INDO-CHINA.

COCHIN CHINA, LOWER, or FRENCH COCHIN CHINA, is a French colony, occupying the southeastern extremity of the Indo-Chinese peninsula. It occupies but a small part of the territory embraced within the former empire of Anam, a region still loosely called Cochin China. (See COCHIN CHINA.) Its area is about 23,000 square miles, and stretches from Cambodia and Anam on the north to the China Sea and the Gulf of Siam. Its population, about 2,035,000, includes between 4500 and 5000 French settlers. There is an army of occupation of 1830 French soldiers, also, besides about 3000 Anamese troops. The development of the colony under French rule has been successfully carried on for some years. Schools, telegraph lines, and railroads have been introduced, and a good trade has been built up. Rice, the principal product, is exported in large quantities to China, Java, and Europe. Other exports are cotton, hides, fish, pepper, and copra. With Anam, Cambodia, and Tonquin it forms French Indo-China. See INDO-CHINA.

COFFEE. Up to 1898 the world's production of coffee was on the increase; the annual output at present is probably more than 13,000,000 bags of 125 pounds each; according to a recent report, the production for 1897-98 was considerably

larger—2,055,768,000 pounds. The recent depreciation of coffee has been due to an oversupply, since the normal consumption is estimated at 12,000,000 bags; and in February, 1899, the world's visible supply was more than 5,700,000 bags, while it was probable that the next crop would suffice for current consumption. The excessive production has been largely due to the Brazilian crop, and the consequent annual decrease in the net receipts of the coffee producers of Latin America is estimated at \$32,000,000 gold.

For the year ending June 30, 1898, the gross importations of coffee into the United States was 870,636,254 pounds, valued at \$65,079,914, or an average of nearly 7½ cents a pound. Of this amount, over 18,800,000 pounds were re-exported or received in transit for foreign countries. About 76 per cent. of the gross importations, representing something more than 63 per cent. of the total valuation, came from Brazil. This country and the other American coffee-producing countries supplied about 95 per cent. of the total importations, representing about 91 per cent. of the total value. The increased importation in 1898 over 1897 was nearly 133,000,000 pounds, but the decline in value amounted to nearly \$16,500,000—that is, the average gross price in 1897 was 11.1 cents a pound and in 1898 about 7.48 cents. The importation for the calendar year 1898, however, was slightly less than that for the calendar year 1897. The importation for the year ending June 30, 1899, was 836,693,053 pounds, valued at \$55,286,429, or 6.6 cents a pound. This is a falling off of 33,943,201 pounds from the importation of 1898, and a depreciation of about 88 cents a pound. But the importation into the United States for the year ending December, 1899, was 878,197,981 pounds, valued at \$56,068,980. Of this amount, Brazil supplied 674,461,411 pounds; other South American countries, 83,177,862 pounds; Central America, 45,303,668 pounds; Mexico, 31,657,552 pounds; the East Indies, 14,053,872 pounds. The importation into the United States for the year ending December, 1898, was 804,263,935 pounds, valued at \$53,654,280. At the close of 1899 coffee was appreciating. Rio Standard No. 7 was valued at New York at 7 cents a pound on December 30.

Though the world's production in 1898 was said to be about 10 per cent. less than the crop of the previous year, the enormous total of 15,955,228 bags of 132 pounds each is reported. The following is the estimated production by countries for 1898:

Countries.	Pounds.	Bags.	Authority.
Brazil.....	1,588,840,000	11,630,000	United States consul.
Venezuela.....	116,407,800	881,877	Exports, October to October.
Guatemala.....	60,238,000	456,424	Native estimate.
Haiti.....	57,000,000	431,812	Dunring and Toon.
Mexico.....	48,145,492	364,729	Official.
Costa Rica.....	85,461,407	667,889	do.
Colombia.....	34,849,639	264,770	Estimated.
Puerto Rico.....	26,400,000	200,000	Spanish estimate.
Salvador.....	16,500,000	125,000	Dunring and Toon.
British West Indies.....	12,300,000	100,000	do.
Ecuador.....	9,858,892	74,681	British report.
Peru.....	2,758,305	20,707	"El Comercio."
Santo Domingo.....	2,400,700	18,187	Belgian report.
Dutch West Indies.....	924,000	7,000	Estimated.
Hawaii.....	726,000	5,500	Partly official.
Honduras.....	612,480	4,640	British estimate.
Bolivia.....	495,000	3,750	Estimated.
Paraguay.....	343,407	2,603	United States consul.
Dutch Guiana.....	219,166	1,660	British estimate.
Cuba.....	132,000	1,000	Estimated.
British Honduras (Belize).....	132,000	1,000	do.
Total, America.....	1,960,619,288	14,653,228	
Java.....	101,904,000	779,000	Dunring and Toon.
Ceylon and British India.....	31,680,000	240,000	do.
Padang.....	5,940,000	45,000	do.
Celebes.....	5,940,000	45,000	do.
Total, Asia and Africa.....	145,464,000	1,109,000	
Grand total.....	2,106,083,288	15,955,228	

The estimated coffee product of the world for the year ending June 30, 1900, is 15,285,000 bags of 134¼ pounds each, apportioned as follows: Brazil, 10,500,000 bags, 6,000,000 being accredited to Santos, 3,750,000 to Rio de Janeiro, and the remainder to other Brazilian ports; Mexico and Central America, 1,500,000 bags; Venezuela and Colombia, 1,250,000; Java, 650,000; the West Indies (chiefly Cuba,

Haiti, and Puerto Rico), 550,000 bags; British India and Manila, 300,000 bags; Arabia and Africa, 250,000 bags; Ceylon, Sumatra, and other East Indian islands furnishing the remainder.

The annual per capita consumption of coffee in several countries of the world is as follows: Holland, 23 pounds; Belgium, 11; United States, 9.95; German, 5.25; France, 3.25; Great Britain, 0.7.

In order to increase the price of coffee, a gigantic combine was proposed early in 1899 by Señor J. A. Olavarria, of Caracas, Venezuela. He suggested that the government of Venezuela should take the initiative by inviting the other coffee-producing countries to be represented at a conference, to the end of forming an international combination for restricting the output. His plan was at present to limit the annual export to 10,500,000 bags, Brazil being allowed 6,600,000 and the remainder proportionally divided among all other countries. Upon the coffee exported would be levied a duty of one dollar a bag, the proceeds thus gained to be applied to buying up the surplus production and to taking measures to bring about an increase in consumption and a decrease in import tariffs in non-coffee-producing countries. A secondary advantage, Señor Olavarria points out, would attach to the governments forming the combine through the increase of import customs consequent upon the increased volume of money among the coffee-producing classes. The increasing surplus would occasionally be reduced by poor crops, but it would seem probable that general liquidation would be expedient at the end of five years, when the surplus might amount to 5,000,000 bags. Liquidation would be effected by putting the surplus on the market and purchasing on the tree an equivalent amount, which should be allowed to rot. Señor Olavarria develops his plan for the league with considerable detail, but against it seems to be not only sound economic theory, but very real obstacles of practical politics.

COGHLAN, CHARLES, actor, died at Galveston, Tex., on November 27, 1899. In light comedy he was one of the best actors on the English-speaking stage. Coghlan was born in Paris in 1842. He took up acting at the age of eighteen. After playing inconspicuously through the English provinces, he appeared in 1870 at the Prince of Wales Theatre and took immediately a prominent place among English actors. Here he was associated for some time with Ellen Terry, and in 1875 he attempted, in a revival with Miss Terry of *The Merchant of Venice*, to reach at a bound the foremost place on the stage. At the same time Henry Irving presented *The Bells* at the Lyceum and completely triumphed over Coghlan in public favor, to the latter's lifelong disappointment. He was introduced in America in 1876 at Daly's in *Money*, and has been prominent here since. One of his best productions was *The Royal Box*. He was also a successful writer and adapter of plays.

COGHLAN, JOSEPH BULLOCK, captain, U.S.N., who took part in the battle of Manila Bay, May 1, 1898, brought himself into notoriety in 1899 by his speech at a dinner given in his honor at the Union League Club, New York, where he criticised the conduct of the German officers toward the Americans during the blockade at Manila. The German press magnified the incident, and it was thought by some to threaten trouble between Germany and the United States. Captain Coghlan was reprimanded by President McKinley. Coghlan was born in Kentucky, was appointed to the United States navy in 1860, became ensign in 1863, lieutenant in 1866, lieutenant-commander in 1868, commander in 1882, and captain in 1896. Since 1897 he has commanded the *Raleigh*, which returned to New York in the spring of 1899.

COINS, VALUE OF FOREIGN. The following tables show the official valuation of foreign coins by the United States treasury: First, in the case of countries with fixed currencies; and, second, in the case of countries with fluctuating currencies, giving the quarterly valuations of the latter during the year 1899.

A.—COUNTRIES WITH FIXED CURRENCIES.

The following official (United States Treasury) valuations of foreign coins do not include "rates of exchange."

Countries.	Standard.	Monetary unit.	Value in U.S. gold.	Coins.
Argentine Republic*	Gold and silver..	Peso.....	\$0.965	Gold—Argentine (\$4.82,4) and $\frac{1}{4}$ Argentine; silver—peso and divisions.
Austria-Hungary†....	Gold.....	Crown.....	.20,3	Gold—20 crowns (\$4.06,2) and 10 crowns.
Belgium.....	Gold and silver..	Franc.....	.19,3	Gold—10 and 20 franc pieces; silver—5 francs.
Brazil.....	Gold.....	Milreis.....	.54,6	Gold—5, 10, and 20 milreis; silver— $\frac{1}{2}$, 1, and 2 milreis.

* In 1874 and 1875, the gold standard prevailed.

† The gold standard was adopted October 1, 1892. Values are still, however, frequently expressed in the florin or gulden, which is worth 2 crowns or 40.6 cents.

A.—COUNTRIES WITH FIXED CURRENCIES.—Continued.

Countries.	Standard.	Monetary unit.	Value in U.S. gold.	Coins.
British North America (except Newfoundland).	Gold.....	Dollar.....	1.00	
British Honduras.....	do.....	do.....	1.00	
Chile.....	do.....	Peso.....	.36,5	Gold—escudo (\$1.25), doubloon (\$3.65), and comdor (\$7.30); silver—peso and divisions.
Costa Rica.....	do.....	Colon.....	.46,5	Gold—2, 5, 10, and 20 colons; silver—5, 10, 25, and 50 centesimos.
Cuba.....	Gold and silver.....	do.....	.92,6	Gold—doubloon (\$5.01,7); silver—peso (50 cents).
Denmark.....	Gold.....	Crown.....	.36,8	Gold—10 and 20 crowns.
Egypt.....	do.....	Pound (100 piasters).	4.94,3	Gold—10, 20, 50, and 100 piasters; silver—1, 2, 10, and 20 piasters.
Finland.....	do.....	Mark.....	.19,3	Gold—10 and 20 marks (\$1.93 and \$3.85,9).
France.....	Gold and silver.....	Franc.....	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Germany.....	Gold.....	Mark.....	.23,8	Gold—5, 10, and 20 marks.
Great Britain.....	do.....	Pound sterling.....	4.86,6½	Gold—sovereign (pound sterling) and half sovereign.
Greece.....	Gold and silver.....	Drachma.....	.19,3	Gold—5, 10, 20, 50, and 100 drachmas; silver—5 drachmas.
Haiti.....	do.....	Gourde.....	.96,5	Silver—gourde.
Italy.....	do.....	Lira.....	.19,3	Gold—5, 10, 20, 50, and 100 lire; silver—5 lire.
Japan *.....	Gold.....	Yen.....	.49,8	Gold—1, 2, 5, 10, and 20 yen.
Liberia.....	do.....	Dollar.....	1.00	
Netherlands †.....	Gold and silver.....	Florin.....	.40,3	Gold—10 florins; silver—½, 1, and 2½ florins.
Newfoundland.....	Gold.....	Dollar.....	1.01,4	Gold—\$3 (\$2.02,7).
Portugal.....	do.....	Milreis.....	1.08	Gold—1, 2, 5, and 10 milreis.
Russia.....	do.....	Ruble.....	.51,5	Gold—imperial (\$7.71,8) and ¼ imperial (\$3.80); silver—¼, ½, and 1 ruble.
Spain.....	Gold and silver.....	Peseta.....	.19,3	Gold—25 pesetas; silver—5 pesetas.
Sweden and Norway.....	Gold.....	Crown.....	.26,8	Gold—10 and 20 crowns.
Switzerland.....	Gold and silver.....	Franc.....	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Turkey.....	Gold.....	Piaster.....	.04,4	Gold—25, 50, 100, 200, and 500 piasters.
Uruguay.....	Gold.....	Peso.....	1.03,4	Gold—peso; silver—peso and divisions.
Venezuela.....	Gold and silver.....	Bolivar.....	.19,3	Gold—5, 10, 20, 50, and 100 bolivars; silver—5 bolivars.

* Gold standard adopted October 1, 1897.

† See note to table of fluctuating currencies.

B.—COUNTRIES WITH FLUCTUATING CURRENCIES.

Countries.	Monetary unit.	1899.			
		Jan. 1.	April 1.	July 1.	Oct. 1.
Bolivia.....	Silver boliviano.....	\$0.43,9	\$0.43,4	\$0.44,3	\$0.43,6
Central America.....	Silver peso.....	.43,9	.43,4	.44,3	.43,6
	Amoy tael.....	.71	.70,2	.71,6	.70,5
	Canton tael.....	.70,8	.70	.71,4	.70,3
	Chefoo tael.....	.67,9	.67,2	.68,4	.67,4
	Chinkiang tael.....	.68,3	.68,6	.69,9	.68,9
	Fuchau tael.....	.65,6	.65	.66,2	.65,2
	Hankwan tael.....	.72,2	.71,4	.72,8	.71,8
	Hankau tael.....	.66,4	.65,7	.67	.66
	Ningpo tael.....	.68,2	.67,5	.68,6	.67,8
	Niuchwang tael.....	.66,5	.65,9	.67,1	.66,1
China.....	Shanghai tael.....	.64,8	.64,1	.65,4	.64,4
	Swatow tael.....	.65,5	.64,9	.66,1	.65,1
	Takao tael.....	.71,4	.70,7	.72	.71
	Tientsin tael.....	.68,8	.68	.69,4	.68,3
	Silver peso.....	.43,9	.43,4	.44,3	.43,6
	do.....	.43,9	.43,4	.44,3	.43,6
	Silver rupee.....	.20,8	.20,6	.21	.20,7
Colombia.....	Silver dollar.....	.47,7	.47,2	.48,1	.47,4
Ecuador.....	Silver kran.....	.08,1	.08	.08,2	.08
India*.....	Silver sol.....	.43,9	.43,4	.44,3	.43,6
Mexico.....					
Persia.....					
Peru.....					

* The commercial value of the rupee to be determined by consular certificate.

See MONEY.

COKE. The total production of coke in the United States in 1898 was 15,897,797 tons. In the twelve months of 1899 the production was 19,344,883 tons, the increase being due chiefly to the great activity in iron manufacture. A development of great importance in coke manufacture is the utilization of the by-products of gas, ammonia, tar, etc., by the use of special ovens for the purpose. This has rendered the coals of several localities available for coke manufacture which have previously been considered unavailable, owing to their high sulphur contents or to their large percentage of volatile matter. Pennsylvania, Alabama, and Kentucky are the three principal coke-producing States.

COLENSO, Rev. WILLIAM, F.R.S.E., missionary and naturalist, was born at Penzance, England, and died in New Zealand about February 10, 1899, at the age of eighty-seven years. In 1833 he went to New Zealand as a missionary and printer for the Church Missionary Society, and printed the first book published in the islands. Mr. Colenso was regarded as an authority on the natural history of New Zealand and on Maori antiquities and myths.

COLLEGE SETTLEMENTS. With the close of the year 1899 the College Settlements Association, whose work in social settlement has been among the foremost efforts of the kind, reached its decennial anniversary. During the ten years of its existence the association has grown from representation in four colleges, Smith, Vassar, Wellesley, and Bryn Mawr, to the possession of chapters in twelve colleges, the additional ones being Radcliffe (at Harvard), Wells, Packer Institute, Swarthmore, Elmira, Women's College of Baltimore, Barnard (at Columbia), and Sage College (at Cornell). Its subscription list reaches \$6000, a sum derived chiefly from college and professional women. During the period referred to, the extension of the settlement movement has been large, including the founding of the Rivington Street Settlement, reaching into several buildings, at New York; the Hull House, at Chicago; a large Philadelphia settlement, which during the year 1899 was newly housed and located, with a prospective gymnasium and a public hall; and a Boston house. Other enterprises throughout the country number in all about eighty settlements. These settlements run from the simplest possible form to the more elaborately organized institutional houses, but all except a few include the idea of neighborhood residence as well as neighborhood work. The large settlement colonies at New York, Philadelphia, and Boston, all of which are administered by the College Settlements Association, report rapid growth during 1899. Since the previous report the Boston settlement has rented the basement and ground floor of the building adjoining Denison House, the settlement's headquarters, for the use of cooking classes and for a boys' club and a men's reading-room. The programme of the organized settlement work in educational and social matters includes nearly fifty weekly engagements. At New York the Rivington Street house is overcrowded, and as the two houses of the settlement were full early in the year, additional rooms were taken in a near-by tenement. This settlement is doing especially good work among the young people of the slums through its literary, social, and athletic clubs, its industrial classes, and its home improvement and city history societies. The library occupies more space than formerly on the daily schedule, being open one more afternoon during the week, and is rendered more effective by systematic management and good additions to its shelves. The kindergarten, fresh air, and summer home departments were other noteworthy branches carried on successfully during the year. The Philadelphia settlement, having been forced out of its house by the demolishing of the tenement houses about Rodman Street, is now at work on plans for the purchase of a double house, to be altered into a residence suitable for settlement purposes. It is also intended that a public hall and a gymnasium shall be acquired at the earliest possible day. A recent gift of \$3000 was made toward aiding the accomplishment of this aim. The Philadelphia settlement is also urging the city council to transform the old slum square, formerly occupied by the tenements, into an open space for park purposes, making an improvement similar to that carried out by New York in the old Mulberry Bend district. The Philadelphia tenement district above mentioned is a populous one, there being 11,000 children in attendance at a dozen public schools within a radius of four blocks of the settlement house. The statement of the year shows the following record of work done in this neighborhood: Kindergartens, 100 children; social and study clubs and classes, 193; dancing classes, 50; gymnasium classes, 55; sewing classes, 91; English classes, 25; bank depositors, 351; circulating picture-library, 19 members; average attendance at the public settlement meetings, 336; total number influenced by above activities, 1219. About 1900 patients were treated, under the Visiting Nurse Society, by various serving physicians. Some 800 or 900 were benefited by the special summer work, including play-ground privileges, open-air parties, and concerts, picnics, and kindergartens. The Settlement Country Club, boarding residents at a very small cost, had fifteen regular and 55 transient

inmates per week during two months of the summer. The officers of the College Settlements Association are: Vida D. Scudder, Boston, president; Mabel G. Curtis, Boston, secretary. At the New York settlement Susan G. Walker is chairman of the local executive committee, and Elizabeth S. Williams is the head worker; at Philadelphia, J. Rodman Paul, chairman, Anna F. Davis, head worker; Boston, Cornelia Warren, chairman, Helena S. Dudley, head worker.

COLLETT, JOHN, M.D., Ph.D., formerly state geologist of Indiana, and a well-known business man of Indianapolis, died in that city March 15, 1899. He was born at Eugene, Ind., January 6, 1828; was graduated in 1847 at Wabash College, Crawfordsville, and later at the Central College of Physicians and Surgeons, Indianapolis. From 1870 to 1873 he served in the Indiana senate. During this time and until 1878 he was assistant state geologist, and in the latter year and in 1879 was a member of the New State House Commission. In 1879-80 Dr. Collett was chief of the bureau of statistics and geology, and from 1881 to 1885 served as state geologist. Besides a large number of papers on geology he published six volumes of geological reports with many maps and figures. Some of his works are regarded as authorities in this country and abroad.

COLOMB, PHILIP HOWARD, vice-admiral of the British navy, retired, died at his home in Botley, Hampshire, October 14, 1899. He was one of the greatest English authorities on naval affairs. Colomb was the third son of General G. T. Colomb, and was born in Scotland May 29, 1831. He was educated privately, and in 1846 entered the navy; in the following year he participated off the coast of Portugal in the suppression of an insurrection. In the revolutionary period of 1848 he served in the Mediterranean, and in China from 1849 to 1851 in the suppression of piracy. He took part in the Burmese war of 1852, and went with an expedition to the Arctic regions in 1854; in the following year he served in the Baltic campaign. In 1868-70 he commanded the *Dryad* in the East Indies in the suppression of the slave trade; two subsequent commands were the *Audacious* in China in 1874-77 and the *Thunderer* in the Mediterranean in 1880-81. From the last-named year to 1884 Colomb was captain of the steam reserve at Portsmouth and flag-captain at Portsmouth during the next two years. In 1886 he was retired for age.

Besides being a high authority on naval evolutions, Colomb was the inventor of a number of appliances and details now deemed indispensable in war ships. In 1859 he introduced a system of signals in the army, and he devised the system of flash signals adopted by the navy in 1867. The latter system, generally called the Morse system because of its notation, is now said to be in universal use. In 1865 he presented to the navy plans for a system of steam tactics, which were adopted and have ever since been used. In 1873 he invented a system of interior lighting for warships, now used as an alternative for electric light. For many years Colomb worked for an amendment to the rules for preventing collisions at sea; to this end he wrote a number of pamphlets and books, including *Our Peril Afloat*, 1879, and *Danger of the Modern Rule of the Road at Sea*, 1885; his measure met with success at the Washington Maritime Conference of 1889. He was president of various departmental committees, including those on invasions, fouling of ships' bottoms, machine guns, and victualling stores. At the time of his death he was nautical assessor to the House of Lords. Among Colomb's publications, besides those named above, are: *Slave-Catching in the Indian Ocean*, 1873; *The Manual of Fleet Evolutions*, 1874, which system of tactics is official; *Fifteen Years of Naval Retirement*, 1886; *Naval Warfare*, 1891; *Essays on Naval Defence*, 1893; *The Naval War Game*; *The Collision Diagram*, 1896; *Memoirs of Admiral Sir A. Cooper Key*, 1898.

COLOMBIA, the most northwestern republic of South America, is bounded on the north by the Caribbean Sea and Venezuela, on the east by Venezuela and Brazil, on the south by Peru and Ecuador, and on the west by Ecuador and the Pacific Ocean. The capital is Bogotá.

Area and Population.—Colombia comprises nine departments, having a total estimated area of 513,938 square miles, of which about one-third are south of the equator. The official estimate of 1881 placed the population at 3,878,600; according to the estimate of 1895, the inhabitants number about 4,000,000, including 150,000 Indians. The largest department and also the most sparsely inhabited is Cauca; area, 257,462 square miles, population about 2.4 a square mile. The provinces most densely inhabited by the square mile are Santander, about 35, Antioquia and Boyacá, each 21, Tolima, 17, and Bolivar, 13. The principal cities are as follows, the populations given being probably somewhat too small, as figures for 1899 are not obtainable: Bogotá, 120,000 (according to a census taken in 1899 the population was only 80,000); Barranquilla, 40,000, a commercial town on the Magdalena River, twenty miles from the coast, connected therewith by rail; Medellin, 40,000, also a commercial town and situated in a mining district; Panamá, 30,000, and Cartagena, 20,000, ports on the

Pacific and Atlantic coasts respectively; Bucaramanga, 20,000, capital of Santander and an important coffee centre; Ibagué, 12,000, capital of Tolima; Popayan, 10,000, capital of Cauca; Cúcuta, 10,000. The president of France has been asked to arbitrate boundary disputes between Colombia and Costa Rica.

Government.—By the constitution, dating from August, 1886, the chief executive authority is vested in a president, who is chosen for a term of six years by electoral colleges, and is officially assisted by a cabinet of eight members, responsible to the congress and representing the departments of foreign affairs, the interior, finance, public instruction, war, and the treasury. The president in 1899 was Señor M. A. Sanclemente. The legislative power devolves upon a congress of two houses—the senate and the house of representatives; the former is composed of 27 members, each department delegating three senators, and the latter of 66 members, elected by popular vote, the nominal ratio of representation being one member for each 50,000 inhabitants. The departments, which were formerly sovereign states, retain some of their former prerogatives, including matters of finance; they are administered by governors, who are appointed by the president, and who hold office during his pleasure.

Army and Navy.—At each session of congress the strength of the regular army is determined, but in the event of war the president may call for the mobilization of such forces as are necessary, all able-bodied citizens being liable to military service. The number in the regular establishment in 1898 was placed at 1000. Colombia is practically without a navy, the government having only three small vessels, one of which is a river gunboat.

Finance.—The principal source of revenue is customs duties, and the chief items of expenditure are war, public works, justice, payment on public debt, and finance. The revenue and expenditure for the two-year period, 1897-98, were officially estimated in pesos at 34,361,000 and 35,771,013, respectively; for the two-year period, 1899-1900, the estimate was: Revenue, 34,305,000 pesos, and expenditure, 34,000,000 pesos.

Customs receipts have been: 1895, 10,750,889 pesos; 1896, 13,697,823 pesos; 1897, 13,256,353 pesos; these figures are exclusive of the duties on postal parcels, which for the three years amounted to 96,837 pesos, 221,416 pesos, and 280,947 pesos, respectively.

The total internal public debt on June 30, 1896, was 7,525,156 pesos; in addition, the government was responsible for a paper currency amounting to 30,862,352 pesos. In the same year the external debt, due largely to British creditors, was, including arrears, £3,514,442 (\$17,101,275). Subsequently (January, 1897), the government and the bondholders agreed upon a mode of settlement, and new bonds were issued for £2,700,000 (\$13,138,200). The coinage of the country is almost limited to small silver pieces, minted for the government in Europe; in 1896 this amounted to about 3,000,000 pesos. The value of the peso in United States currency on October 1, 1899, was \$0.436.

By an executive decree of August 18, 1899, the government announced its desire to negotiate a foreign loan of £3,000,000 (\$14,598,000) for the purpose of converting Colombian paper into silver currency. As pledges for the loan the government offered "the rental of the emerald mines of Muzo and Coscuez, the product of the match monopoly, the annual sums due from the Panama Railroad Company to the republic, and the interest of the republic in the Panama Canal." The condition of public finance in 1899 was very unsatisfactory, and was said to be a principal cause of the insurrection which broke out in the autumn. This is treated in a succeeding paragraph.

Industries.—Mining is the most important industry of the republic. Agriculture ranks second, but as yet is little developed, only a small part of the tillable soil being under cultivation; the country is admirably adapted for many tropical products, but agricultural development is retarded by difficulties of transportation. Manufactures are almost unknown; there are iron works, however, at Pradera, northeast of Bogotá. The principal crop is coffee, the cultivation of which for the last few years is said to have been on the increase, though in 1897 the export fell off considerably. Other products are cacao, sugar, tobacco, cabinet and dye woods, vegetable ivory, fruits, rubber, wheat, maize, vanilla, indigo, and medicinal plants. The rubber product is obtained entirely from wild trees. There are large grazing districts, especially in the department of Tolima.

The mineral wealth of Colombia is very great. The most important metal mined is gold; other minerals found are silver, copper, mercury, lead, platinum, iron, manganese, emeralds, cinnabar, coal, petroleum, and salt. Gold exists in all of the departments, but is taken most successfully in Antioquia, where there are about 3400 gold mines, and in the region of Darien. There are many silver mines in Tolima and Cauca, in which departments the whole number of mines is about 700 and 575, respectively. For the exploitation of emeralds there have been reported 32 mines; this industry is carried on chiefly in the region of Muzo, on the Minero

River, and the value of the annual output from that place is said to be nearly \$100,000. The government has a monopoly of the salt mines at Zipaquirá, north of Bogotá, and receives therefrom large revenues. It was announced in July, 1899, that the government had granted a concession for working the deposits of sea salt in the department of Panama, on condition that a duty of 37.9 cents (Colombian currency) be paid to the national treasury for each 12½ kilograms (27.56 pounds) of salt taken out.

Commerce and Shipping.—The chief imports include foodstuffs and liquors, textiles, and iron and steel goods; among the leading exports are coffee, cacao, silver, cotton, live animals and hides, cabinet and dye woods, tobacco, and rubber. Of all the imports about three-fifths enter through Barranquilla and one-fifth through Cartagena. The foremost country in Colombia's foreign trade is Great Britain. The value in pesos of the imports and exports has been as follows:

	1895.	1896.	1897.	1898.
Imports.....	11,528,365	16,947,135	18,136,598	11,346,028
Exports.....	15,088,406	18,597,352	16,820,411	19,735,733

The coffee exports for three years have been: 1895, 21,504,657 kilos, value, 8,504,312 pesos; 1896, 28,521,410 kilos, 10,474,752 pesos; 1897, 17,564,103 kilos, 8,799,129 pesos.

Colon and Panama are free ports and their transit trade, which in value is more important than the direct commerce of the country, is not included in Colombia's trade statistics. The freight carried in the fiscal year 1896-97 from Panama to Colon was: For Europe, 69,637 tons; for New York, 40,290. From Colon to Panama: From Europe, 77,553; from New York, 53,564. The local freight in both directions amounted to 34,013 tons. One steamer of 457 tons and seven sailing vessels of 1770 tons comprised the merchant marine in 1896. In the same year there entered at the customs ports of the republic 2074 vessels of 910,764 tons, and cleared 2061 vessels of 867,130 tons; the arrivals in 1897 were 1891 vessels of 858,457 tons, and the clearances 1850 vessels of 800,710 tons.

Communications.—The roads of the country are in a very primitive condition, being for the most part merely paths or mule tracks. The government, however, has taken measures to improve some of the more important routes. It was reported in 1899 that the total length of railways open for traffic is 663 kilometres (412 miles); in addition, there are about 270 miles unfinished.

There touch at the Colombian ports each month 33 regular steamers, of which 15 are British and 9 American. The length of telegraph lines in 1894 was 6835 miles, and the number of offices, 319.

Religion and Education.—The state religion is Roman Catholic, but religious toleration exists to some extent. Primary education is free, but not obligatory. In 1894 the primary schools numbered 1817, with an attendance of about 89,000 pupils; in the same year there were 15 normal schools, with an enrolment of about 600. For secondary education there have been reported various private and 34 public institutes. There are 4 colleges under departmental government control, with about 1100 students. A national university, comprising collegiate and technical schools, has about 1600 students.

The Panama Strike.—In the second week in January, 1899, a strike over a question of wages began among the dock and railway employees at Colon. It was taken up at Panama and was augmented by the sailors and firemen of the Pacific Mail steamers and the Pacific Steam Navigation Company. Business was necessarily suspended, freight amounting to 1000 tons lying at Panama and ships being obliged to leave port without changing their cargoes. After the strike had lasted five weeks, the railway and steamship agents accepted the terms demanded by the strikers—\$2.20 a day in Colombian currency—and the lockout came to an end on the 16th of February. During the strike there was some rioting, but it was not attended with serious results.

Arbitration Award.—On October 27, 1899, after two and one-half years of consideration, the Anglo-Colombian Court of Arbitration rendered its decision at Lausanne, Switzerland, in the dispute concerning the Medellín-Magdalena River Railway between the Colombian government and the engineering firm of Punchard, McTaggart, Lowther and Company, London. Colombia's claim of some \$20,000,000 was dismissed and an award of over \$200,000 was made in favor of the English firm. The tribunal also declared that Colombia should pay the award within six months, and that it should also pay 60 per cent. of the cost of arbitration.

Insurrection.—In the fall of 1899 a revolutionary movement developed in Colombia. The cause for dissatisfaction seemed to be the financial confusion brought about by the great quantities of paper money issued by the government, while at the same time the foreign bonds were in dispute. Little that was absolutely definite or

authentic was reported concerning the revolution, which was still in progress at the close of the year. The disaffection did not spread to any great degree to the northern districts of the republic. The most severe conflict seems to have been a naval battle on the Magdalena River, near the town of Puerto Nacional, in which the insurgents suffered the more severely. Toward the end of October the insurrection was reported to be confined to the departments of Santander and Bolivar; in the latter state the insurgents were said to have suffered defeat on November 9, and varying reports were made concerning the progress of the rebellion. The government took active measures for its repression, but at the close of the year it was believed that the insurgent cause was progressing. Industry and commerce, it was announced in December, were almost paralyzed.

COLONIAL DAMES OF AMERICA, organized in 1890, with patriotic and educational aims, has a large number of members and subordinate branches in many States. President, Mrs. John Lyon Gardiner; secretary, Mrs. T. M. Cheesman, 109 University Place, New York City.

COLONIAL DAMES OF AMERICA, NATIONAL SOCIETY OF THE, organized in 1890, is distinct from the foregoing, had in 1899 a membership of nearly 27,000. President, Mrs. Justine Van Rensselaer Townsend; secretary, Mrs. William Reed, 103 Monument Street, W., Baltimore, Md.

COLONIAL WARS, SOCIETY OF, founded in 1892, to perpetuate the memory of the events and persons connected with the wars of the American colonies. Governor-general, Frederic J. de Peyster; secretary-general, Walter L. Suydam, 45 William Street, New York City.

COLONIES. Questions arising out of the relations between the United States and its newly acquired lands led to much discussion of colonies and colonial policies in 1899. Specific facts in regard to the chief colonies in the world will be found in the separate articles on the colonies, dependencies, and protectorates, and for a record of the events of the year which bear on the colonial relations of the United States see the articles UNITED STATES (paragraphs on History), CUBA, HAWAII, PHILIPPINES, and PUERTO RICO. The present article is concerned only with general matters which came up in the course of discussion. Early in 1899 the bureau of statistics of the United States Treasury Department issued a monograph on the *Colonial Systems of the World*, which, after a general account of the systems employed by the chief colonizing nations, gave a detailed account of each colony under its own title, and presented tables showing the area, population, form of government, and commerce of all the colonies, dependencies, and protectorates.

Colonial Systems.—The colonial systems of the world may be roughly divided into, first, those which are based on the principle that the colony is to be exploited for the benefit of the mother country, and, second, those which regard the administration of the colonies as a sort of trust to be executed for the benefit of the natives. An illustration of the former is afforded by the colonial system of the Netherlands, and especially by the Dutch administration of Java, where the inhabitants, numbering some 25,000,000, are governed by a handful of Europeans. This "culture system," as it is called, was introduced about seventy years ago. The essential point in it was that the island was regarded as a huge farm which was to be worked for the profits of the rulers. After it was placed in good working order it yielded an annual surplus to the home government, but, in the course of time, the returns fell off and the system is now regarded with less favor. One feature of it, however, has met with success—that is, the practice of employing native functionaries to co-operate with the ruling class in the administration of the laws. (See JAVA.) The best illustration of the other colonial policy, which regards the work of the governing class as a trust for the benefit of the natives, is afforded by the colonial system of Great Britain. In general, Great Britain's policy has been to render her dependencies self-governing wherever it was possible. Those colonies whose inhabitants have shown a capacity for administering their own affairs have obtained the right of doing so, and even where this has not been done the governing class has, on the whole, shown due regard for the interests of the natives. It is a flexible system and admits of great variety. The governors are always appointed by the crown, but the law-making power is left with the people when their political capacity has seemed to justify it. In some cases all the members of the legislative bodies are elected by the people; in others a part are elected and a part appointed by the home government, and in still others the appointments are divided between the home government and local trade and municipal organizations, the home government always retaining the veto power. The British colonies may be grouped in three classes: First, crown colonies, which are wholly under the control of the home government; second, representative colonies in which the home government, while retaining a veto on legislation and the control of public offices, leaves the law-making to colonial legislative bodies; and, third, colonies with responsible govern-

ments, in which the crown's authority is limited practically to the appointment of a governor and to the veto power as to colonial legislation, leaving the law-making function and the control over public offices in the hands of the local population. In the discussion of the colonial problem during the year there was substantial agreement upon this one point, that the British system offered a far better model than that of any other country with large colonial possessions. In the French colonies far less legislative power is left with the local population, although the more important colonies, such as Algeria, are directly represented in the French legislature. Many French writers themselves have expressed dissatisfaction with the working of their own system. M. Hanotaux and M. Leroy-Beaulieu, for example, have pronounced it a failure, the latter complaining especially of the practice of choosing the colonial officials from the home administration and of regarding their colonial work as a mere step in the line of their promotion. The German colonial system is said also to err on the side of an excessive officialism—that is, too rigid adherence to bureaucratic methods. Great Britain's policy seems finally to have broken completely with the idea of using her colonies as a direct source of pecuniary gain. The question then arises: What advantage comes to the mother country by colonial expansion? This advantage is wholly indirect. It has been defined by some as consisting in the ability which it affords to the energy and enterprise of the inhabitants of the home country and in the fostering of trade.

The number of colonies, protectorates,*and dependencies of the world has been placed at 125, their area at two-fifths of the world's surface, and their population at one-third of the world's inhabitants. They are for the most part centred in the torrid zone. The bureau of statistics places the average annual imports of the colonies and protectorates at more than \$1,500,000,000, and estimates that 40 per cent. of this consists of purchases from the home countries. The exports have an even higher value, and 40 per cent. of them are also said to be sent to the home countries. As to trade policies it would seem that the commerce between the most successful colonies and their mother countries has been placed on practically the same footing as that with other countries; and in the case of Great Britain, at least, the trade with some of her most progressive colonies, while increasing absolutely, forms a smaller proportional share of the total commerce of these colonies as time goes on. It is estimated, for example, that, while the British colonies of North America purchased 50 per cent. of their imports from the United Kingdom in 1871, they obtained only 30 per cent. from that source in 1896, and there was a corresponding decline in the relative importance of the home trade in the case of the South African and Australian colonies.

Europeans in the Tropics.—The question of acclimatization has become very prominent in connection with the movement toward colonial expansion. It is the conclusion of Mr. Kidd in his *Control of the Tropics* that the white race cannot flourish in tropical regions, and he has supported this view by a mass of evidence. Others maintain that a comparatively short period of residence will suffice for the acclimatization of the white man in tropical lands if he takes proper sanitary precautions. Apart from the purely physiological aspect of the question there are many difficulties in the way of the successful administration of tropical dependencies. The inhabitants of tropical countries maintain a different attitude toward the government from that of the natives of temperate regions. Tropical races are more indifferent toward governmental aims and less inclined to progress. The invincible idleness of the people, which has been bred by the extreme ease of securing a livelihood, invariably discourages the new administrator. The non-tropical colonies of Great Britain show marked differences from the tropical in the value of their trade. It has been estimated that while such colonies as Australia, Canada, and Newfoundland import British produce to the value of \$15 per head of their population, the tropical colonies import only 56 cents' worth. Some writers argue that natives of the tropics will never become capable of self-government in the sense in which the Anglo-Saxon uses the term; and they hold it is wrong to assume that administrative capacity is the necessary accompaniment of intellectual attainments in other fields. At the present time there is great divergence of opinion on this point, and it is well illustrated in the case of India, where one group of writers believe in the principle of "India for the Indians," while another, though admitting the intellectual capacity of the Hindoos, and even their superiority to white races in respect to a certain subtlety of mind, deny completely their administrative capacity or their ability to deal efficiently with practical affairs. The important outcome of this branch of the discussion is the general belief that whatever may be the ultimate results of political discipline, the tropical races require a far more paternal form of government than advanced communities in the temperate zone would willingly endure. The British government of India has been taken by some as an instructive type of white government in the tropics and as affording, in respect to some of its features, a possible model for the United States in its administration of the Philip-

pires. Among the characteristics of the Indian government which have found especial favor with students of colonial affairs the following may be noticed: The governing class in India has pursued a policy of indifferentism in regard to the native religions, neither favoring one at the expense of the other, nor trying to force the religion of the rulers upon the subject race. Again, the Indian administration has profited by the high standard set for entrance into the Indian civil service. This has resulted in the development of a select class of trained officials which has been recruited from the very best element in the population of the United Kingdom. The civil service, has, in fact, offered an honorable career, with prospects of great advancement, to men of administrative talent and energy, and, in spite of its many defects, it has brought into existence a class that have proved their fitness for the business of governing a dependent race. The form of government is as follows: At the head is the secretary of state for India, who governs with the assistance of a council and resides at London. On Indian soil the chief executive is the viceroy, or governor-general, who is also assisted by an executive council which consists of the heads of the departments. This council constitutes a legislative body when to it are added the governor of the province in which it is held, the official delegates from Madras and Bombay, and certain unofficial representatives of European and native communities. Below the chief executive for all India are the governors of each of the two presidencies, with their councils, the lieutenant-governors of Bengal, the Northwestern Provinces, and the Punjab, and the chief commissioners of the other provinces. Below these come the collector magistrates or deputy commissioners of the 238 districts. Each province has its own judicial system under the high court. The derivation of authority is from above. It is a paternal system, not constitutional and representative. Its effectiveness is a matter of debate, but the benefits that have been claimed as resulting from it are the maintenance of peace and order, the building of extensive public works, the fair administration of justice, the simplification of the taxes, the mitigation of plagues and famine, the free development of trade, and the bringing of justice within the reach of all. For further details of the administration see the article INDIA.

Colonial Problems of the United States.—The discussion of the colonial question in the United States followed the same lines as in the previous year—that is, it was concerned first with general matters of colonial policy, including such things as the proper form of government to be established, the peculiar needs of each dependency, and the difficulties in the way of a satisfactory administration; second, the constitutional question—that is, the extent to which the constitution places limitations upon the conduct of the United States toward its dependent territories. In the article on the United States and in the separate articles on Cuba, Hawaii, the Philippines, and Puerto Rico will be found an account of specific matters connected with the relations of the United States to these dependencies. The present article aims only to present some of the most striking points in the general discussion. As to the general question of colonial policy, it should be noted at the outset that the acquisition of the new territories present very different problems. The least difficult of these problems is presented by Hawaii, where the Anglo-Saxon race has been established for many years, and where Anglo-Saxon institutions may, it is thought, be introduced without difficulty. Still the matter is complicated by the presence in Hawaii of a large number of subjects of foreign states. In Cuba the main difficulty consists in the presence there of a large Spanish element in the population, and in the eagerness on the part of the Cubans for immediate independence. But the main problems are concerned with Puerto Rico and the Philippines. There are peculiar difficulties in the administration of each of these dependencies. Puerto Rico is a subtropical colony inhabited by a European race, and the chief task will be the reconciliation of this race to a change of rulers and the training of it in forms of government that are peculiar to an Anglo-Saxon civilization. The Philippines, on the other hand, are a tropical country inhabited by Asiatics. Of these Mr. Bryce says: "Probably no task has been presented to the English in India or in any of their colonies during the last fifty years so difficult as that to which Americans will have to address themselves when they become responsible for these islands."

Puerto Rico.—There is great difference of opinion as to what should be the proper form of government for Puerto Rico—whether it should be a protectorate of the United States, or an unorganized territory, or a territory organized in the regular way until ready for statehood; how long military rule should be retained, to what extent natives should be represented in the legislature, and how far the United States system of government should be grafted upon the present system. In regard to the most obvious solution of the problem—namely, the establishment of a territorial form of government as a preparation for statehood—it has been said that the ordinary criterion for admission of a territory as a State will fail in this case. Puerto Rico already has sufficient population to entitle it to statehood; yet its admission must be deferred until it receives a proper training in self-government. In the mean-

while some method of colonial government must be adopted. Of the methods employed by the colonizing nations, the system of a governor appointed by the home government and a legislature chosen by the colony has been proposed by some, but is open to the objection that it promotes friction between the colonial and home governments, and the experience of England with her North American colonies is offered as an illustration of its bad results. It has been the policy of England to introduce a responsible form of government as soon as the colonies were fit for it. In her West Indian colonies there is a legislative council, partly elected and partly chosen, and the governor bears the same relation to it as the premier in the British government bears to Parliament. The introduction of responsible government in Puerto Rico would, however, be unsafe until the people had been trained in political affairs. If Puerto Rico remains a dependency and not a protectorate one of two forms of government may be established: Either an assembly chosen from the people and having strict limitations placed upon its powers, leaving other affairs to the governor and his appointed council, or a legislative body made up partly of appointed and partly of elected members may be made the basis of the system. The latter course has been advocated as better adapted to a people unfamiliar with constitutional government. As to the local government, it has been urged that it should aim to foster the participation of the natives in political affairs and to accustom them to manage their own business. A qualification of the franchise in such a way as would make it naturally extend as the colony advanced in education and prosperity has also been advocated, and another essential point is the establishment of a permanent civil service which should be, so far as possible, recruited from native Puerto Ricans. Mr. Abbott L. Lowell, the author of *Essays on Government*, refers to the judicial system as presenting the most important question of all. It does not seem to him that the common law should take the place of the present system, but the courts should be organized on the American basis and the people should be thoroughly familiarized with American judicial conceptions. To change the law of the land to the extent of replacing the civil law, which now obtains there, by the common law, seems to him oppressive. He advocates the administering of the civil law by means of the American judicial system. Some writers take a very favorable view of the capacity of the Puerto Ricans for self-government, and favor the earliest possible establishment of a native legislature and an administrative system carried on by native officials. There has been a fear that the military rule might be too prolonged, and that the placing of too many Americans in the government might lead to the evils of carpet-bag rule.

Philippines.—Here the problem of colonial rule is very different, since the white men must always bear such an insignificant proportion to the Asiatic natives. On the general principle which should underlie the governmental system for the islands there is substantial agreement. It is conceded, for example, that religious toleration should be practised toward Christians and Mohammedans alike, that a certain degree of paternalism in the government is necessary, that the revenues should be spent upon the country, and that efforts should be made to give the natives a share in the government and fit them for managing their own affairs. England's attitude toward the native states of India and of the Malay Peninsula is often cited as affording a good precedent for our policy in the Philippines. The English have learned by experience the wisdom of preserving in India every native state, subject to certain limitations in the matter of succession to the throne, the native military force, the taking of white men into the service, and the requirement that the prince shall admit to his dominions a British resident who will watch the administration and will give advice. To what extent the existing authority of chiefs could be utilized in this manner in the Philippines is to be learned by experience. The good effects of such a system are that they remove to some extent the responsibility from the governing nation and prevent discontent by permitting native rule. The status of foreigners in the Philippines presents a difficulty if the military rule be continued as some advise. The denial to these foreigners of civil rights would place the United States in an embarrassing situation, especially when these rights are guaranteed to them by treaty with their own country. The immigration of the Chinese threatens to bring about the same results as in the Straits Settlements, where their greater aptitude for business has resulted in placing them in control of the larger part of the smaller trade of the country and ousting the natives who feel toward them a bitterness which is augmented by the difference in race and customs. Among other warnings which have been given by students of this matter is that an undue regard for party politics in the appointment of colonial officials in the Philippines will bring disaster. A thorough knowledge of the native character and a just and consistent policy in the administration are the first requirements of our policy. It is urged that native functionaries be associated with American officials in the administration, that the civil service take on a distinct and permanent character, as in the case of the Indian civil service, and that of Holland's colonies. The

governor should be aided by an advisory council of officials and should be allowed a large measure of discretion in all matters not affecting the outside relations of the colony. Minor offices and magistracies should be filled by the natives, and native troops should be employed under American officers. These and the many other suggestions on the subject look to a strong and paternal form of government in which no attempt would be made to force a constitutional representative system upon people who were unfit for it. One writer goes so far as to say that "we need to place a benevolent despot in every district in the Archipelago," but, while there is substantial agreement as to the broad principle of the policy of the United States toward the Philippines, there is, as in the case of Puerto Rico, a wide divergence as to the political status of the islands and the restrictions imposed upon their government by the constitution.

Constitutional Question.—The main question is: Does the constitution of the United States extend of its own force to territories and dependencies of the United States? The reasons for an affirmative answer have been briefly summarized in an article by Professor T. S. Woolsey, of which some of the main points are as follows: The moment the Congress of the United States begins to legislate for the Philippines constitutional guarantees apply. These guarantees relate to security of life, liberty, and property, and are contained in the body of the constitution and its amendments. They may be comprised under the heads of citizenship, justice, revenue, bankruptcy acts, military forces, titles of nobility, freedom of opinion and speech, and slavery; or, to state some of the chief guarantees more specifically: religious freedom, freedom of speech and press, right of assembly and petition, right to bear arms, security from search and seizure, and from quartering troops, right of trial by jury, and other judicial securities. Of the guarantees which undoubtedly extend to all United States territory the most important is the right of trial by jury, in regard to which the constitution says that the "trial of all crimes, except in cases of impeachment, shall be by jury and such trials shall be held in the State where the said crime shall have been committed, but, when not committed within any State, the trial shall be held at such place or places as the Congress may by law have directed." It would follow from this clause and from its enforcement by judicial decisions that no conviction for crime could be had in any of our new possessions after the establishment in them of civil government, except upon trial by jury. And the same thing would apply to the guarantees against slavery in the United States or in any place subject to its jurisdiction; the provision for religious liberty, for indictment by grand jury in the case of an infamous crime, for the prohibition of cruel or unusual punishments, etc. Since the establishment of civil government would necessarily introduce these guarantees, the only alternative is to continue military rule, for the character of the natives is such as to render any form of government based on these principles impracticable. They have been described as incapable of gratitude, profligate, untrustworthy, improvident, treacherous, and superstitious, though these qualities are accompanied with such inconsistent traits as cleanliness, sobriety, and patience. A government that would be bound to admit trial by jury or the right of assembly, or the right to bear arms would be of short duration. The military system is sufficient. So long as Congress remains inactive the duty of making the internal rules and regulations for the administration of the territory rests with the executive. It permits the despotic form of administration which is after all best adapted to the needs of the islanders. The same powers would be intrusted to the President as were conferred upon him by the first act relating to Louisiana in 1803.

The opposing view rests on the assumption that the term United States as used in the constitution has a double meaning, sometimes referring to the States collectively, and sometimes to the sovereign power resident in the union of the States. It is held that the constitution of the United States does not extend beyond the limits of the States, which are united by and under it. It is only the thirteenth amendment, prohibiting slavery, that applies to any place subject to its jurisdiction. The others relate only to the States and the people of the States, and it is expressly stated in the constitution that "Congress shall have power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States" (Article 4, section 3). It is admitted that certain *dicta* of the Supreme Court make against this view, but it is held that mere expressions of opinion on the part of judges will not be allowed to control subsequent decisions. The general line of the argument may be sufficiently indicated by the discussion of the restrictions imposed by the constitution in the matter of citizenship, trial by jury, and revenue. Amendment XIV. prescribes that "all persons born or naturalized in the United States and subject to the jurisdiction thereof are citizens of the United States and of the State wherein they reside"; and Amendment XV. that "the right of citizens of the United States to vote shall not be denied or abridged by the United States or by any State on account of race, color, or previous condition of servitude." If these are effective, every child born in the Philippines and Puerto Rico after

the treaty went into effect is a citizen of the United States. This assumes that as a result of the treaty the Philippines and Puerto Rico became parts of the United States, but this is not the case if the United States means here the States united under the constitution. This is the meaning taken by those who believe that the constitution does not of its own force apply to the new lands. On this assumption birth in Puerto Rico and the Philippines would not bring citizenship, because a person born outside the United States in this sense has a status not defined by the constitution. Congress may define this status as it chooses. The legislative and the treaty-making powers may grant citizenship. In all treaties of cession before that ceding Puerto Rico and the Philippines citizenship was in fact established by the treaties themselves. The power that can grant can also withhold. The courts have never decided that a person born in a territory is a citizen of the United States in the meaning of the amendments. As to the judicial power, the Supreme Court has decided that Congress may establish in the territories such courts as it pleases. The guarantee of jury trials does not apply to these territorial courts, whose procedure may be fixed by legislation just as they may be created by legislation. Only the courts created by the constitution are subject to constitutional limitations. Against this there are several *dicta* of the Supreme Court, and in one case it was decided that a citizen of the District of Columbia had a constitutional right to a jury trial and in another the court stated that the provisions of the constitution in regard to jury trials applied to territories.

As to revenue, Article I. declares that "all duties, imposts, and excises shall be uniform throughout the United States." Here, as in the case of citizenship, the matter hinges on the meaning of the term United States. Those who oppose the doctrine that the constitutional restrictions apply to dependent territories hold that the term United States as used in this article means the States united under the constitution. The taxing power over such territories rests on the general grant to Congress of the right to make all needful rules and regulations for the government of the territories. (Article IV.) See ECONOMIC ASSOCIATION, AMERICAN.

COLORADO, a Western State of the United States, has a land area of 103,645 square miles. The capital is Denver. Colorado was admitted to the Union August 1, 1876.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 2,911,488 bushels, \$1,251,940; wheat, 7,337,781, \$4,182,535; oats, 2,448,846, \$1,028,515; barley, 337,932, \$185,863; rye, 33,236, \$15,953; potatoes, 2,713,536, \$1,492,445; and hay, 1,630,274 tons, \$11,982,514. Live stock, January 1, 1900, comprised, horses, 145,713, \$4,068,081; mules, 8580, \$399,827; milch cows, 93,499, \$3,384,664; other cattle, 1,021,922, \$28,297,538; and sheep, 2,185,327, \$6,250,036.

Industries.—The progress of an exceptionally good year in general mining interests was briefly interrupted by the operation of an eight-hour day law passed by the legislature on March 16. The law was made applicable to all mines and smelters, and went into effect on June 15. Before that date the unions of operatives affected by the new law made a demand for ten hours' pay for the proposed eight-hour day, and as this demand was refused, a general strike of miners and smelters was declared. For a month the situation grew worse daily. On July 17 the Supreme Court of the State handed down a decision declaring unanimously that the new law was unconstitutional. Under this decision the strikes, which had become reduced to one of the smelters only, were declared off early in August. In nearly all of the principal mines the eight-hour day was adopted, and the scale of wages readjusted amicably between the miners and the operators. One of the first effects of the calling off of the strike was the release of several thousand carloads of ore for shipment to the smelters. The State's output of all grades of gold ore showed a falling off of about \$500,000 per week during the six weeks of the strike.

The enlargement and extraordinary production of the Cripple Creek gold camp and the unexpected development of a new boom in the Leadville district are the most prominent features of the year's record. The December showing of Cripple Creek dividend payers was the greatest in the camp's history. The total output of the mines up to November 7 was \$15,000,000, and the new mining from that date to the close of the year, added to the surplus ore then piled up at the mills for reduction, was expected to bring the year's record close to \$20,000,000, an increase of 25 per cent. over 1898. At the end of the year, while complete results were still unreported, the indications were that every mining camp in the State would show an increased output. The production had reached a point where railroads, reduction mills, and smelters were totally unable to handle the tonnage offered. The United States branch mint at Denver reported the receipts of gold amounting to \$21,144,287 in the fiscal year ending June 30, 1899, against \$16,240,441 in the previous fiscal year, and of this total 97 per cent. was from Colorado mines.

The great appreciation of the Cripple Creek properties started Denver and Colorado Springs in a race for the control of trade there, and the railroad systems of both cities were rapidly extended to the great camp in the closing months of the year. Colorado Springs also became a rival of Denver in the handling of mining stocks, an exchange being opened there in September to take the overflow from the Denver board, which has been working to its full limit for several months. The final estimate of the director of the mint on the production of gold and silver in the United States in the calendar year 1898 credited Colorado with \$23,195,300 in gold and a silver output of 22,815,600 fine ounces, of a commercial value of \$13,460,204. The output of coal was 4,076,347 short tons, valued at \$4,686,081, an increase of 714,644 tons in a year; iron ore, 318,480 long tons; pig iron, 91,222 long tons; all kinds of rolled iron and steel, 99,050 long tons, and of quarry products, granite, sandstone, and limestone to the value of \$224,870.

Banks.—On October 31, 1899, there were 36 national banks in operation and 29 in liquidation. The active capital aggregated \$4,147,000; circulation, \$1,901,782; deposits, \$45,246,491; and reserve, \$21,370,053. The State banks, July 3, 1899, numbered 28, and had capital, \$1,315,000; deposits, \$6,453,987; and resources, \$7,934,426; and private banks, 7, with capital, \$90,026; deposits, \$171,403, and resources, \$296,268. The exchanges at the United States Clearing-house at Denver in the year ending September 30, 1899, aggregated \$165,276,506, an increase of \$24,467,014 in a year.

Education.—At the close of the school year 1897-98 the school population was 135,007; enrolment in public schools, 104,723; and average daily attendance, 69,973. There were 2982 teachers, 1704 buildings used as school-houses, and public school property valued at \$5,987,703. The revenue was \$3,004,587; expenditure, \$2,341,311, of which \$1,473,276 was for teachers' salaries. There were 39 public high schools, with 208 teachers and 4928 secondary students; 63 private secondary schools, with 293 teachers and 2238 secondary students and 6735 elementary pupils; a public normal school, with 16 teachers and 502 students in all departments, and a private one, with 9 teachers and 191 students. Normal training was also given in two colleges. Four colleges and universities for men and for both sexes reported 55 scholarships; 225 professors and instructors; 1417 students; 55,257 volumes in the libraries; \$69,100 invested in scientific apparatus, \$1,406,400 in grounds and buildings, and \$616,910 in productive funds, \$236,067 in total income; and \$67,075 in benefactions. In 1899 there were 318 periodicals, of which 39 were dailies, 246 weeklies, and 26 monthlies.

Railways.—During the calendar year 1898 the new railway construction amounted to 30.75 miles, giving the State a total mileage in 1899 of 4608.85. New steam and electrical construction in 1899, the latter connecting large mining camps, is estimated to have added at least 350 miles to the total length.

Finances.—The total assessed valuation on November 30, 1898, was \$192,243,080, a decrease in a year of \$5,756,920, and the tax rate was \$4.10 per \$1000, the same as in the previous year. The total debt, December 1, 1898, was \$3,877,942, and the treasury held assets of \$849,275, leaving the net debt \$2,728,667, an increase in a year of \$31,027.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 527,000.

Opening the Ute Strip.—In accordance with the proclamation of the President, the Southern Ute Indian lands were opened to settlement at noon on May 4. The tract includes all the unallotted and unreserved lands within the former Ute reservation. The rush for homesteads was much greater than was expected; the town of Tabor was located at a point 40 miles south of Durango within an hour; and within a week more than a dozen villages were started, several hundred buildings were under construction, and the railroads were being extended through the section.

Legislation.—A constitutional amendment changing the method of adopting amendments to the constitution will be voted upon in 1900. A large amount was appropriated to sink artesian wells for irrigating and domestic purposes. A law was enacted providing that if one of two or more joint debtors is released by a creditor, the liability of the remainder is not affected. The provisions of the law concerning game and fish are most drastic. A State game and fish commission is to be appointed with extraordinary powers. License or consent must be obtained to keep wild animals or fish in private parks, or to import, store, or transport the same. In all civil cases three-fourths of the jury may render verdicts. The State is building roads by the direct appropriation of large amounts. Attendance at school was made compulsory. All wages must be paid in money, and store or "truck" orders were prohibited, and a very liberal mechanics' lien law was enacted. A State board of library commissioners was created, and cities may levy a tax for public libraries.

Municipal Elections.—The total vote cast for mayor in Denver showed a large majority in favor of municipal as distinguished from corporation control of public utilities. The Democratic and Independent platforms were almost identical, so far as the municipal ownership of water-works, lighting plants, and transit facilities was

concerned. The Silver Republican party was regarded as upholding corporations. A Democratic mayor, Mr. H. V. Johnson, was elected.

State Officers and National Representatives.—Governor, Charles S. Thomas; lieutenant-governor, Francis Carney; secretary of state, E. F. Beckwith; treasurer, John H. Fesler; auditor, George W. Temple; adjutant-general, J. C. Overmyer; attorney-general, D. M. Campbell; superintendent of education, Helen Grenfell. Supreme court: Chief justice, John Campbell; associate justices, Luther M. Goddard, William H. Gobbert; clerk, H. G. Clark. The state legislature consists of 30 Democrats, 8 Republicans, 29 Populists, and 33 Silverites. Senators: Edward O. Wolcott (Rep.), from Denver, and Henry M. Teller (I.), from Central City. Representatives: John F. Shafroth (Sil.), from Denver, and John C. Bell (Pop.), from Montrose.

COLORADO FORMATION. The rule adopted last year by the commission of foreign and American geologists of applying locality names to divisions of the fourth order is carried out in the following table, recently printed, in which Logan gives the following for the Colorado Formation:

	<i>Kansas Area.</i>	<i>Colorado Area.</i>	<i>Black Hills.</i>	<i>Iowa, Nebraska.</i>
Niobrara Series.	Pteranodon beds.	Aplshapa beds.	Shale, lime.	Wanting.
	Fort Hays limestone.	Upper Timpas.	Limestone.	Chalk limestone.
Benton Series.	Shale group.	Carlisle shale.	Shale.	Wanting.
	Limestone group.	Greenhorn limestone.	Limestone.	"
	Bituminous shale.	Graneras shale.	Shales.	Shales.

COLORADO STATE HISTORICAL AND NATURAL SOCIETY. See ANTHROPOLOGY IN AMERICA.

COLORED METHODISTS comprise the African Methodist Episcopal, the African Union Methodist Episcopal, the African Methodist Episcopal, Zion, and the Congregational Methodist Churches. These four bodies had in 1899 a total of 8238 ministers, 7548 churches, and 1,199,631 communicants, the first and third named being the most important. The thirtieth session of the general conference is to be held in Washington, D. C., May, 1900.

COLUMBIA, BRITISH, a province of the Dominion of Canada, with an estimated area of 383,300 square miles, exclusive of the territorial seas; capital, Victoria.

Mineralogy.—The production of the precious metals in the calendar year 1898 was: Gold, placer, \$643,346; lode, \$2,201,217; silver, \$2,375,841; copper, \$874,781, and lead, \$1,077,581. The output of coal was 1,135,865 tons, valued at \$3,407,595; coke, 35,000 tons, value, \$175,000; other mineral products, \$151,500, making the total value of the mineral production of the year, \$10,906,861. Gold from placer mines gradually decreased in output from \$3,913,563 in 1863 to \$643,346 in 1898. The discovery of gold in the Atlin Lake region has led to so many complications that both the Dominion and the provincial governments have been forced to take cognizance of the situation. At first the Atlin Lake gold fields were believed to be in the Northwest Territory; now they are declared to be in British Columbia. Many claims belonging to Americans were recorded by the gold commissioner as being in the Northwest Territory. The declaration that they are within British Columbia is a most serious matter for American miners, as the provincial government has passed a new mining law which prohibits the holding of claims by others than British subjects. Early in 1899 the Dominion government sent an agent to define the boundary between British Columbia and the Northwest Territory, as well as the lines of the Atlin mining district.

Fisheries.—The value of all fishery catches in the calendar year 1897 (the last officially reported) was \$6,138,865, an increase in a year of \$1,954,866. The principal catch was salmon, \$5,185,576; halibut, \$98,375, and herring, \$18,065; exports of all fisheries in 1898 amounted to \$3,846,946; the distribution of fry was 5,850,000, and the capital investment in all fisheries was \$2,514,660.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise aggregated in value, \$8,690,263, nearly all of which was entered for home consumption; exports, domestic and foreign, \$16,919,717, an increase in a year of \$2,902,149; duty collected, \$2,213,593. The registered tonnage of British, Canadian, and foreign vessels carrying cargoes in and out of the province was 2,360,853, and of all vessels in the coasting trade, 4,065,725. Navigation along the coast was facilitated by 24 light stations, 29 lighthouses, 5 fog-horns, and 6 fog-bells.

Banks.—In 1898 clearing-houses were established in Vancouver and Victoria. The Bank of British Columbia was operating seven branch banks, and there were 39 other chartered bank branches. There were also 31 post-office savings banks, with 2884 depositors and \$714,463 deposits, and one government savings bank, with 3437 depositors and \$1,048,829 deposits.

Railways and Telegraphs.—In 1898 the total length of railways was 892 miles, the construction of which had been aided by the provincial government to the extent of \$37,500, and of government telegraph lines, 567 miles, of which 394½ miles were operated by the Canadian Pacific Railway Company, the government paying the excess of expenditure over revenue.

Post-Offices.—At the end of 1898 there were 311 post-offices in the province, in which were posted during the year 6,700,000 letters and 525,000 postal-cards, and 79 money-order offices, which issued 90,674 orders.

Education.—In 1898 there were 228 common schools, with 241 teachers, 7177 enrolled pupils, and 4075 in average attendance; 29 graded schools, with 169 teachers, 10,012 enrolment, and 6704 attendance; and 4 high schools, with 12 teachers, 459 enrolment, and 276 attendance. The expenditures were \$290,255, of which \$168,599 was for teachers' salaries and \$42,499 on account of school-houses, furniture, and repairs. At the end of 1899 there were 37 periodicals, of which 10 were dailies and 22 weeklies.

Finances.—The revenue of the province in the year ending September 30, 1898, was \$1,439,623; expenditure, \$2,001,031; gross debt, \$7,425,262; Dominion government debt allowance, \$583,021; other assets, \$1,996,827; total assets, \$2,579,848; value of public buildings and grounds not included in assets, \$1,875,000; net debt, \$4,845,414.

Population.—Local estimates in 1898-99 gave Vancouver 25,000; Victoria, 24,000; New Westminster, 8750; Rossland, 7000, and Nelson, 4000. The Indian population of the province in 1898 was 24,973. There were 38 schools for Indian youth, which had an enrolment of 1550 and average attendance, 954. The Indians cultivated 13,645 acres of land, had 25,157 head of live stock, and received \$548,953 from their fish, furs, and other industries.

COLUMBIA UNIVERSITY, in New York City, was founded in 1754. During the absence of President Low, who was a delegate from the United States to the International Conference of Peace at The Hague, in May and June of 1899, Professor J. H. Van Amringe, dean of the Columbia College, was appointed by the trustees acting president of the university. The tenth annual report of President Low showed that on June 30, 1899, the net debt against the new site was approximately \$3,575,000, the annual interest upon that sum amounting to \$113,000, and that successful efforts to refund a large portion of the debt had resulted in a reduction of the annual interest charge against the new site by as much as \$37,000. The discharge in full by the president of the obligations entered into by him on account of the construction of the library still further reduced the debt by the sum of \$600,000, so that the annual interest charge against the entire net debt was approximately \$98,000. The site formerly occupied by the college at Forty-ninth Street and Madison Avenue was sold during the year to Dr. John S. White, the principal of Berkeley School. In co-operation with the Teachers' College, acting as a part of the university, arrangements were made for a summer school, to be maintained at the university, beginning with the summer of 1900. With the beginning of the academic year 1899-1900, the advanced work in botany was carried on in the laboratories of the New York Botanical Garden, arrangements having been completed during the year for the removal to the garden of the herbarium of the university and of the principal part of the botanical library. On July 1, 1899, Mr. George H. Baker retired from active service as librarian and became emeritus librarian on half salary; and James H. Canfield, LL.D., president of the Ohio State University, succeeded him as librarian. During the year 25,404 volumes were added to the library, 5141 volumes by gift. During the year the university received gifts for current uses, amounting to \$73,794.33, and for permanent endowment, amounting to \$490,417. During the year Mr. and Mrs. William D. Sloane transferred to the university the building erected, enlarged, and endowed by them, known as the Sloane Maternity Hospital. Completely furnished and equipped, it represents an expenditure of \$526,300, and is provided with an endowment amounting to \$373,300. For statistics see UNIVERSITIES AND COLLEGES; see, also, PSYCHOLOGY, EXPERIMENTAL.

COMETS. See ASTRONOMICAL PROGRESS.

CONCRETE. See HYDRAULIC CEMENTS.

CONGO FREE STATE. The constitution of the Congo Free State was recognized and defined by an international conference, held at Berlin in 1885, at which time certain foreign rights and privileges, such as free trade and internal navigation, were guaranteed to the principal nations. The sovereignty of the state having been established, that country was placed under the rule of Leopold II., King of Belgium, who had contributed generously to the exploration and opening of the Congo territory, and who had in 1883 founded the Congo International Association, the forerunner of the state. By a will, dated 1889, the King bequeathed to Belgium his sovereign rights in the state, and in 1890, by a treaty between Belgium and Congo, the former country was given the right to annex the state after a period of ten years.

This period ends during the year 1900. The Congo Free State has an area of about 900,000 square miles. Its estimated population is about 20,000,000, which includes about 1060 Belgian inhabitants and about 600 other Europeans.

Trade and Commerce.—Under the Belgian rule, established in consequence of the European conference at Berlin in 1885, the Congo state has, on the whole, prospered, and has immensely contributed also to the welfare of Belgium. The improvement of Belgian trade is shown by the statement of the United States consul-general at Antwerp that in 1885, at the time of the foundation of the Congo state, five European firms controlled the trade of the Congo River basin. There were almost no Belgian imports at the time, and no Belgian firm had established commercial relations in that region. In 1898, thirteen years later, the activity of the Belgians had created within that country twenty-four commercial companies, with a capital of about \$19,000,000. With commerce almost nothing in 1885, it amounted in 1897 to \$2,509,000 for exports from the Congo to Belgium, and to \$3,088,000 for imports from Belgium to the Congo. The feeling of uncertainty regarding the success of the "Congo affair" in 1885 had given way in 1899 to confidence, which was attested by the large investment of Belgian capital in the various important enterprises awaiting development in the Congo territory. The success of certain commercial companies and of the railroad undertaking have in particular drawn the attention of Belgian financiers to the value of the country to Belgium. At a recent celebration by the city of Antwerp of the progress of the Congo Free State the King outlined the future policy of the government concerning trade. He emphasized the recent commercial development in Africa, and pointed to the probability that the railway now finished and others to be constructed would increase Belgian-Congo commerce in an even greater ratio than in the past. The policy would be to imitate Germany in the formation of numerous export associations, and to encourage by all private and official means the establishment of trade centres in Africa. The King urged an increase in the number of plants and factories on the banks of the river Scheldt, which he termed the "rival of the Clyde." As Belgians had been the first on the European continent to build lines of railways, they were urged by the king to supplement these railroads by lines of steamers, and he called for regular lines to the African trading regions of Belgium. In consequence of the King's speech, Belgian capitalists almost immediately became interested in the project of establishing a line of steamers between Antwerp and the Congo Free State, to be manned by natives of the country. The idea, as reported, is to put shares on the market capable of being popularly subscribed for, and it is expected that there will soon be a considerable increase in the Belgian merchant marine through the development of Belgium's African trade possibilities. Such a marine, together with the opening of the interior by railways, promises a large commercial growth and prosperity. This increase in commerce has already been stimulated by the new railroad around the rapids of the Congo, which will furnish easy transit to Stanley Pool, some 250 miles above, and connect the lower river with the recommencement of the navigable Congo, whence vessels may ascend the stream for 1000 miles. A branch line is contemplated, also, from this road to Leopoldville, and an auxiliary line to connect the Lubefu with the Lomami and the Luabala. In 1899 the government authorized a survey for branch lines to connect the Welle and the Nile regions with that of Tanganyika. Nearly a thousand miles of road will have to be constructed if this scheme is carried out.

Complete trade returns for the Congo Free State are not available for a period later than the year 1897, the figures for which, however, afford satisfactory proof of the rapid development of the state's resources. The total aggregate of trade for 1897 amounted to 40,884,288 francs, or not quite \$8,000,000, an increase of 25 per cent. over 1896 and nearly double the total trade figures for 1893. The total exports amounted to 17,457,090 francs as against 15,091,137 francs for 1896, and the imports amounted to 23,427,197 francs as compared with 16,040,370 francs in 1896. Among the exports a very considerable increase has taken place in the amount of India-rubber now obtained from different parts of the Congo State, the figures being 241,153 kilos for 1893; 338,194 for 1894; 576,517 for 1895; 1,317,346 for 1896, and 1,662,380 for 1897. Other exports consist of palm oil, ivory, palm kernels, nuts, rice, orchilla, gum copal, ground nuts, and cam wood. About 223,776 kilos of coffee were exported during 1897. In consequence of the large exportation of rubber, the early destruction of the India-rubber trees in Congo has been threatened, the prevention of which was taken in hand by the Congo government in 1899. A bureau of control of rubber forests has been created and is charged with the enforcement of the decree of 1892, which forbids the gathering of rubber by any other mode than through incision in the bark. A decree has been issued, also, providing that for every ton of rubber annually yielded there shall be planted not less than 150 trees. As regards imports, two-thirds of the trade is now in the hands of Belgium. It is in the imports that the greatest increase in Belgian-Congo commerce has come about. No statistics previous to 1892 are obtainable as to the value of the goods imported by the Congo

state, but the following figures show the fourfold increase of Belgian goods imported by Congo within the five years ending with 1897: The year 1893, 4,442,662 francs; 1894, 6,227,909 francs; 1895, 6,003,465 francs; 1896, 10,162,407 francs; 1897, 16,272,029 francs. During this period the imports from England, Germany, and Netherlands have remained practically stationary, and French and Italian trade has shown a natural growth. Portuguese trade has declined.

Civilisation and Government.—There is a central government at Brussels under King Leopold, with the three departments of foreign affairs, finance, and interior under a secretary of state. At Boma, the Congo capital, a governor-general administers the local government and European commissioners govern the various administrative districts. The future political policy was set forth by the King in his speech at Antwerp, when he declared that the state should be kept an absolutely neutral power, as Belgium had been. The army, commanded by European officers, consists of about 16,000 natives. The state has 20 steamers, divided between the upper and lower Congo, the larger number patrolling the river above the Stanley Pool, and it has besides a small navy of sailing vessels. The difficulties of governing over the vast stretches of the Congo, with its millions of inhabitants, are increased by a number of conditions due to the location and climate of the state. The first of these is the task of enforcing obedience to law among forest tribes, whose number is very great and whose dialects are innumerable, and which have little or no political union. An instructive account of some of the characteristics of these natives has been given by Mr. Albert B. Lloyd, the young Englishman who recently crossed the continent alone, except for native attendance, along the general route taken by Stanley. He entered Belgian territory at the frontier fort M'Beni, on the Semliki River, thence traversing the heart of the great pygmy forest, the northern part of which was crossed by Stanley. He travelled down the entire length of the Aruwimi, passing through immense tracts of forests, inhabited only by cannibals, to the junction of that river with the Congo. In this section he came in contact with the cannibal Bangwa tribe, which he describes as a very warlike people, who are noted for their wonderful workmanship in iron, which they make into spears, knives, etc. "They are at present," he says, "more or less cowed by the Belgians, but I doubt if this condition of affairs will be permanent, and I believe the Belgians will have trouble with them yet. There are many Congo state posts down the Aruwimi with white officers, and apparently they manage to keep on fairly good terms with the cannibals, by whom they are surrounded. Personally I was received most kindly by these cannibals. They are, it is true, warlike and fierce, but open and straightforward. I did not find them to be of the usual cringing type, but manly fellows, who treated one as an equal. I had no difficulty with them whatever." In regard to the many reported military movements on the Congo, Mr. Lloyd said in an interview late in 1899 that, according to report, Baron Dhanis was on an expedition in the Kasai district, and was experiencing great difficulty, especially in the matter of transport, owing to the swampy character of the country. The only other expeditions known of were those of Lieutenant Henry, who was on the way from Stanley Pool to Lado, and of Major Lothaire, who had just left Bangala for the north. Large numbers of troops were being trained at Bangala. Generally speaking, the whole Congo was quiet—certainly tranquillity prevailed along the river. An expedition was about to be sent north of Basoko against a very hostile tribe, and it was reported that it was not safe for any European to go more than two hours' journey to the north of Basoko. Besides the question of native control, there is also the unhealthfulness of the Congo climate, a condition strikingly set forth by consular reports of 1898, in which it is estimated that of every ten whites who become officers of the state, nine are buried or invalided within three years. It is also said that out of the twenty-four months for which the one hundred and twenty employees of the largest Belgian trading company contract, there is maintained an average service of only seven months.

Among the best efforts of the Congo administration in behalf of the native, has been the repression of the liquor trade among the wild tribes of the Congo, who are wild enough even when not under the unwholesome influence of European rum. A second benefit is the gradual suppression of inter-tribal wars, and the spread among the natives of a fear and dependence on a central government power; this result has been partially accomplished against the enormous disadvantages already mentioned. Credit is also claimed by the government for the diminution of cannibalism. The Belgians have also broken up the Arab and native slave trade. They require the slave, however, to pay for his freedom by a term of service with a new master for merely nominal wages. While the slave is from the first a free man nominally, and at the end of his term completely free, he is, while under the workings of the "libéré" system, a slave in fact. The state supports this system for the purpose of easily obtaining cheap labor. It must be fairly stated that the missionaries tell a different story of the effects of Belgian rule on the Congo natives from that

given out by the administration. Among their charges is the claim that the libéré system is itself a slave system, reserved by the government for its own benefit, while denying slavery to others; they say that great cruelty is practised upon the natives by officials, and they deny the assertion that cannibalism is decreasing. There appears to be considerable difficulty in getting at the facts in these matters.

The description given by Mr. Lloyd of his remarkable journey through Congo contains no more interesting or instructive a passage than that which tells of his experience in the wonderful pygmy forest of central Africa. His journey from the Belgian frontier post of M'beni on October 1, at which point he entered the great forest, is described by him in an interview quoted by the *Geographic Magazine*:

"Altogether I was twenty days walking through its gloomy shades. I saw a great many of the little pygmies; but, generally speaking, they keep out of the way as much as possible. At one little place in the middle of the forest, called Holenga, I stayed at a village of a few huts occupied by so-called Arabs. There I came upon a great number of pygmies, who came to see me. They told me that, unknown to myself, they had been watching me for five days, peering through the growth of the primeval forest at our caravan. They appeared to be very frightened, and even when speaking covered their faces. I slept at this village, and in the morning I asked the chief to allow me to photograph the dwarfs. He brought ten or fifteen of them together, and I was enabled to secure a snapshot. I could not give a time exposure, as the pygmies would not stand still. Then with great difficulty I tried to measure them, and I found not one of them over four feet in height. All were fully developed. The women were somewhat slighter than the men, but were equally well formed. I was amazed at their sturdiness. Their arms and chests were splendidly developed, as much so as in a good specimen of an Englishman. These men have long beards half way down the chest, which imparts to them a strange appearance. They are very timid and cannot look a stranger in the face. Their eyes are constantly shifting, as in the case of monkeys. They are fairly intelligent. I had a long talk with the chief, and he conversed intelligently about the extent of the forest and the number of his tribe. I asked him several times about the Belgians, but to these questions he made no reply. Except for a tiny strip of bark cloth, men and women are quite nude. They are armed with bows and arrows—the latter tipped with deadly poison—and carry small spears. They are entirely nomadic, sheltering at night in small huts two to three feet in height. They never go outside the forest. During the whole time I was with them they were perfectly friendly.

"There are no Europeans in any part of the forest, but there are a few villages containing three or four houses, which are known as auxiliary Belgian stations. They are occupied by so-called Arabs, who have been placed there by the Belgians. In parts I found a fairly good track, perhaps a couple of feet wide, overhung and crossed by boughs and enormous creepers; but, generally speaking, it was easier to cut our way right through the tropical growth. In places the darkness was very great. Once I tried to photograph my tent at midday, but even with nearly half an hour's exposure the attempt was a failure. Occasionally I came upon a very small natural clearing; but, generally speaking, the growth was very dense, and it was like advanced twilight. In many places it was impossible to read even at noon. I walked during the three weeks I was going through the forest, as, although I had a donkey with me, if I had ridden him, I should have continually been pulled off by the creepers. We had several narrow escapes from falling trees. On one occasion my two boys and myself, who were at the head of the party, had just passed under an enormous tree, when it fell with a crash between us and the rest of the carriers. Had we passed two seconds later, it would have fallen on us. I measured one tree which had fallen across the track, and found it to be twenty feet in circumference. The deathlike stillness of the forest was continually broken by reports like thunder as these giant trees fell crashing to the ground. At night-time these reports were most startling. The forest is literally alive with elephants, leopards, wild pigs, buffalo, and antelope. Fires at night kept off any leopards that might have been prowling round our little encampment. At night I used to fasten my tent to the trunks of trees and surround the camp with a zariba of small trees. We never had a guard at night. The first Europeans I met after leaving the forest were two Belgian officers at a place called Mawambi, on the Ituri River. Just after reaching that place I again struck Stanley's route, and marched for ten days along the banks of the Ituri to the village of Avakubi. Travelling here was very difficult—in fact, almost as bad as in the great forest. The tracks were all overgrown and the country practically uninhabited. Its only occupants were cannibals. At Avakubi, which place I reached on October 20, I got two large dugout canoes and embarked on the Aruwimi. The natives rigged up a little covering on one of the boats for protection from the sun, and this nearly cost me my life. I was in this boat and we were just starting down a strong rapid when the craft began to sink, and I was unable to get free of the covering. I eventually got to the surface in an exhausted condition, but

I lost a large number of photographs. Ten days' journey down the Aruwimi brought us to its junction with the Congo at Basoko. This was regarded as a very quick journey, but we were, of course, going down-stream. At one place I put together the bicycle I had with me, and, at the suggestion of these people, rode round their village in the middle of a forest. The scene was remarkable, as thousands of men, women, and children turned out, dancing and yelling, to see what they described as a European riding a snake. At Basoko, on the Congo, I embarked in the river steamer *Ville de Bruxelles* and came down the river, calling at stations *en route*. After a journey of six hundred miles in the boat I reached Leopoldville on November 24. There I joined the railway, which I may say is one of the most wonderful things I have seen in Africa. I travelled in an arm-chair in an excellent saloon carriage, and finally reached Matadi, whence I proceeded to join the Portuguese mail steamer for Lisbon."

CONGREGATIONALISTS, a body of Christian churches in the United States. In 1899 they held an international council in Boston, the second in the history of this denomination. Their American Missionary Society and Home Missionary Society have established missions in Cuba and Puerto Rico. The next triennial meeting will be held at Portland, Me., in October, 1901. The Congregationalists report 5639 ministers, 5620 churches, and 628,234 members. The latest report of the commissioner of education shows the Congregationalists to have 26 institutions of learning, with 492 professors, 4472 students, and endowment funds aggregating \$9,640,291.

CONGREGATIONAL METHODIST CHURCH, organized in Georgia in 1852, has congregations in the Southern States, and in Illinois, Pennsylvania, Delaware, and New Jersey. A semi-monthly paper is published by them at Cave Spring, Ga. In 1899 they had 260 ministers, 275 churches, and 13,000 communicants.

CONGREGATIONAL NATIONAL COUNCIL, composed of delegates from the Congregational churches, organized in 1871, meets once in three years. Its next meeting will be held in Portland, Me., in October, 1901. Officers: Rev. Frederick A. Noble, moderator; Rev. H. A. Hazen, Auburndale, Mass., secretary; Rev. S. B. Forbes, treasurer; and Rev. W. H. Moore, registrar.

CONGRESSIONAL LIBRARY, founded in 1800, destroyed in 1814 when Washington was captured, and reorganized after the gift of Thomas Jefferson's library. In 1899 the librarian of Congress, John Russell Young (*q. v.*), died, and Herbert Putnam (*q. v.*) was appointed his successor. In the report of the librarian, dated December 4, 1899, the present librarian states that during the last fiscal year, ending June 30, 1899, the total expenditures were \$159,854, and that the copyright business brought in a net income of \$17,994. The total annual disbursements for the maintenance of the library were \$106,395, including \$20,000 for furniture. Since the last librarian's report there were added 56,316 books and pamphlets, making a total in 1899 of 957,056 books and pamphlets in the library. During the year 1899, 1866 manuscripts were added, including 220 large cases of manuscripts, books, and pamphlets constituting the Spanish archives at San Juan de Puerto Rico. The number of maps and charts added was 1986, making a total of 52,181. The librarian had in preparation a bibliography of works relating to the construction, care, classification and cataloguing of maps, a list of maps in the library of Congress relating to the Revolutionary War, and a list of those relating to the city of Boston. In the 13 months ending June 30, 1899, 23,983 musical compositions were added, making a total of 277,465; during the last fiscal year 10,915 prints were added, making a total of 70,823. The main reading-room is open from 9 A.M. to 4 P.M. from July 1 to September 30, and until 10 P.M. the rest of the year, and during the last year there were recorded 121,270 readers. The books supplied were 297,662 and 20,650 books were issued for home use. A reading-room for the blind was open daily, and was visited by 31,000 persons, of whom, however, only 885 were unseeing. The law library consists of 103,906 volumes.

CONNAUGHT and STRATHEARN, DUKE OF (Prince Arthur William Patrick Albert), third son of Queen Victoria, was born in Buckingham Palace, May 1, 1850. In 1866 he entered the military academy at Woolwich, and became lieutenant in the Royal Engineers in 1868, and lieutenant in the Royal Artillery in 1869. On the establishment of the Rifle Brigade in 1871 he was made a captain in excess. In 1874 he was created Duke of Connaught and Strathearn, and took his seat in the House of Lords. In 1878 he married Princess Louise Margaret of Prussia, daughter of Prince Frederick Charles of Prussia. By the death of Prince Alfred of Saxe-Coburg in 1899, he became heir to the Duchy, which he and his heirs renounced in favor of the young Duke of Albany. The Duke of Connaught has served as brigade-major at Aldershot; assistant adjutant-general at Gibraltar, and general of brigade at Aldershot. He commanded the first brigade, first division, in the Egyptian expedition in 1882, and was thrice mentioned in despatches for his work at the battles of Mahshuta



(Courtesy of Review of Reviews.)

THE NEW CONGRESSIONAL LIBRARY AT WASHINGTON.

and Tel-el-Kebir. In 1882 he was made honorary colonel of the Thirteenth Bengal Lancers, serving in Egypt, and in 1886 was appointed to the command of the Bombay army. Returning to England in 1890, he was made commander of the southern district in England. In 1893 he was appointed commander-in-chief at Aldershot, succeeding Sir Evelyn Wood, and was promoted to the full rank of general.

CONNECTICUT, one of the New England States of the United States, has an area of 4990 square miles. The capital is Hartford.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 1,799,811 bushels, \$899,906; wheat, 5490, \$5216; oats, 525,056, \$194,271; rye, 256,464, \$164,137; buckwheat, 72,333, \$45,570; potatoes, 3,323,060, \$1,528,608, and hay, 446,953 tons, \$6,480,818. Live stock, January 1, 1900, comprised, horses, 44,119, \$3,259,754; milch cows, 144,529, \$5,029,609; other cattle, 66,188, \$2,045,545, and sheep, 31,808, \$124,194.

Industries.—In the fiscal year ending June 30, 1899, the collection of revenue on taxable manufactures in the district of Connecticut, which also includes Rhode Island, with Connecticut predominating, aggregated \$2,916,759. There were 54 manufacturers of tobacco and 480 of cigars alone, and the production was 37,942,612 cigars, 916,900 cigarettes, and 26,153 pounds of smoking tobacco. Fruit and grain distilleries in operation numbered 32; amount of fruit brandy produced, 8422 gallons; distilled spirits gauged, 1,264,168 gallons, and fermented liquors produced, 673,299 barrels. The annual report of the State Shell Fish Commission showed an increase of 1000 acres in the amount of oyster grounds under cultivation, and the estimated output of oysters in Long Island Sound in the year was 2,861,455 bushels, against 1,500,000 bushels ten years ago. Quarrying during the calendar year 1898 yielded granite to the value of \$682,768; sandstone, \$215,733, and limestone, \$142,057—total, \$1,040,558.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Fairfield, Hartford, New Haven, New London, and Stonington aggregated in value \$735,221, an increase in a year of \$11,165; exports, none.

Banks.—On October 31, 1899, there were 79 national banks in operation and 19 in liquidation. The active capital aggregated \$20,657,070; circulation, \$8,409,801; deposits, \$44,688,526; and reserve, \$12,176,670. The State banks, June 30, 1899, numbered 8, and had capital, \$2,240,000; deposits, \$7,346,370; and resources, \$10,768,445; loan and trust companies, 13, with capital, \$1,206,100; deposits, \$7,660,387, and resources, \$10,048,424; and mutual savings banks, October 1, 1898, 89, with depositors, 375,810; deposits, \$163,482,299, and resources, \$173,925,546. The exchanges at the United States clearing-houses at Hartford and New Haven in the year ending September 30, 1899, aggregated \$221,297,801, an increase of \$16,277,113 in a year.

Railways.—No new construction was reported in 1898. In 1899 new mileage amounted to 16.40, giving the State a total of 1024.55 miles.

Education.—The annual report of the State Board of Education, issued in 1899, shows a total enrolment in the public schools of 184,386, and an expenditure for running expenses of \$2,896,152, against \$1,408,374 in the previous year. The school population was distributed by counties as follows: New Haven, 56,405; Fairfield, 38,604; Hartford, 36,598; New London, 17,012; Littlefield, 12,581; Windham, 9748; Middlesex, 8192, and Tolland, 5416. The report contains a discussion of existing educational methods, which may be summarized as follows: The chief problems immediately before the State are the gathering of all the children into the schools, the training of skilful teachers, the rescue of children from poor teaching by a higher standard of teaching qualifications, and a radical reform of high school education. For advanced education there were 68 public high schools, with 307 teachers and 6881 students; 62 private secondary schools, with 312 teachers and 2734 students; 4 public normal schools, with 89 teachers, 536 students, grounds and buildings valued at \$290,000, and income, \$16,000; and a school of technology, with 15 teachers and 108 students. The universities and colleges for men and for both sexes numbered 3, and had together 301 instructors, 2963 students, 14 fellowships, 434 scholarships, 323,000 volumes in the libraries, \$6,743,030 invested in grounds and buildings, and \$5,919,771 in productive funds, and total income, \$847,420; benefactions, \$127,500. The Storrs Agricultural College had 100 acres under cultivation, farm land worth \$15,000, and buildings and equipments worth \$70,000. A noteworthy educational event of the year was the election on May 25 of Professor Arthur Twining Hadley, of the chair of political economy in Yale University, as successor to President Timothy Dwight, whose resignation took effect July 1. At the end of the year there were 197 periodicals, of which 48 were dailies, 107 weeklies, and 26 monthlies.

Finances.—The total assessed valuation in 1898 was \$552,887,762, an increase of \$18,422,505 in a year; total funded debt, October 1, 1898, \$3,240,100; civil list funds, \$463,891; net debt, \$2,776,209—reduction in a year, \$340,963. The bulk of the bonded debt is for the renewal of war loans, due in 1903 and 1910.

Harbor Improvements.—In continuation of its work along the Sound, the federal government completed and garrisoned the new fortifications on Plum and Gull

islands, both points being mounted with heavy disappearing guns of the latest pattern. Work on the new fortifications on Fisher's Island and at Napatree Point, near Stonington Harbor, was prosecuted with vigor throughout the year. When these are completed the four points will form a strong barrier against a hostile fleet seeking to pass the eastern entrance to the Sound. Under an appropriation of \$200,000 by Congress, the federal government began establishing a naval coaling station on the Thames River, three miles above New London, and it was expected that the work would be completed in the spring of 1900, with a storing capacity of 25,000 tons.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 875,000.

Legislation.—The constitutional amendments proposed provide that a plurality of votes shall elect State officers and fix the minimum and maximum number of State senators. In the matter of divorces, if they are petitioned for to the General Assembly, they must receive attention from the attorney-general. The national and State flags must not be desecrated. Adulteration of food is forbidden under penalty. Bakeries must not be in cellars and are subject to inspection. Pure water and ice must be furnished. In the interests of the laboring classes it was enacted that no child under fourteen years of age shall be employed during school hours. No employee shall be coerced not to join a labor organization. The inspector of factories must examine all factories and workshops and see that they are well ventilated, that the machinery is well guarded, and that sanitary conditions are perfect. A highway commission was created to supervise and control all State roads. Attendance at school was made compulsory, and no distinction is to be made because of race or color.

State Officers and National Representatives.—Governor, George E. Lounsbury; lieutenant-governor, Lyman A. Mills; secretary of state, Huber Clark; treasurer, Charles S. Mersick; comptroller, Thompson S. Grant; auditor, Walter G. Riley; attorney-general, Charles Phelps; adjutant-general, Louis N. Van Keuren; insurance commissioner, Edwin L. Scofield. Supreme Court: Chief justice, Charles B. Andrews; associate justices, David Torrance, Frederic B. Hall, Simeon E. Baldwin, William Hamersley; clerk, George A. Conant. The State legislature consists of 201 Republicans and 72 Democrats and 3 Gold Democrats. Senators: Orville H. Platt (Rep.), from Meriden, and Joseph R. Hawley (Rep.), from Hartford. Representatives: E. Stevens Henry, from Rockville; N. D. Sperry, from New Haven; Charles A. Russell, from Killingly, and E. J. Hill, from Norwalk—all Republicans.

CONSUMERS' LEAGUE, NATIONAL, United Charities Building, New York City. President, John Graham Brooks; secretary, Mrs. Florence Kelley. The first Consumers' League of America was organized in New York in 1890, as the outcome of inquiries made by the Working Women's Society into the conditions under which saleswomen and cash girls work. The idea at first was to found an organization among these wage-earners, but it was found that the formation of a trades union among this particular class of workers was undesirable, and would be much less useful in bringing about improvement in the condition of working women than an organization among the spenders of money. In recognition, therefore, of the fact that the majority of employers are virtually unable to improve conditions as to wages and hours unless sustained by public opinion, law, and the action of consumers, Consumers' Leagues were formed in a number of cities with the object of forming public opinion so as to lead consumers to recognize their responsibilities and by other methods to ameliorate the condition of the women and children employed in retail mercantile stores. In 1898 the National Consumers' League was formed, composed of the existing State leagues of New York, Massachusetts, Pennsylvania, and Illinois. The most important articles of the constitution adopted by the League are: (1) That the interest of the community demands that all workers should receive not the lowest wages, but fair living wages; (2) that the responsibility for some of the worst evils from which wage-earners suffer rests with the consumers, who persist in buying in the cheapest market regardless of how cheapness is brought about; (3) that it is therefore the duty of consumers to find out under what conditions the articles which they purchase are produced, and to insist that these conditions shall be at least decent and consistent with a respectable existence on the part of the workers; (4) that this duty is especially incumbent upon consumers in relation to the products of woman's work, since there is no limit beyond which the wages of women may not be pressed down, unless artificially maintained at a living rate by combinations, either of the workers themselves, or of consumers. The efforts of the League have been actively directed toward the accomplishment of its purpose, by popular education through meetings, clubs, and literature, and by co-operation with retail merchants in the establishing of "fair houses"—that is, establishments dealing justly with their employees, as will be detailed below. Such

houses are placed on a "white list," to be furnished to consumers. Efforts are made toward the bringing about of regulations insuring fairness as to wages, hours, payment for over-time work, half-holidays during the summer months, an annual vacation of at least one week, equal wages for equal work, irrespective of sex, sanitary and physical conditions, and various minor matters. The Consumers' League further seeks the co-operation of the law and of such of its agents as factory inspectors, health boards, etc., and of clerks' associations, working-girls' clubs, store management and the like, and aims even to influence legislation. The League seeks the abolition of all sweat-shop work, by investigation and by means of the white list, and by the boycotting of goods known to be so made. There is in use a "Consumers' Label," which guarantees to the buyer that the materials bearing it are "white goods," manufactured under conditions tested and approved by the League. Among minor efforts of the League may be mentioned the appeal to merchants to give supper money at the holiday time to girls working in the evening; the endeavor to impress on women shoppers the fairness of shopping before 5 P.M., and not on Saturday afternoons, and the effort to protect delivery clerks from the very late hours by a movement among consumers to decline to receive parcels after a certain hour in the evening. The results of these efforts have in many cases been quite satisfactory. Thirty-five firms in New York City are reported as on the "white list," which shows an improvement of conditions, and a certain amount of consideration and co-operation already at work. The mercantile inspection law of New York State, passed in 1896, was largely due to the suggestions and influence of the Consumers' League and its friends. By this law State protection was extended from the factories to mercantile establishments, regulating hours, labor, sanitary conditions, leisure for luncheon, and the matter of seats behind counters. In New York, in 1898, the city government cut off the appropriation for the special inspectors under this law, but the Board of Health is co-operating with the League in giving attention to the more flagrant violations. A higher standard, all in all, is felt to have resulted from the passage of the bill. The State labor law, which went into effect September 1, 1899, is expected to afford aid to the league in its war on the sweat-shop system. Whereas the old law allowed the tenant or family of the tenant to manufacture clothing in his dwelling-place without notifying the factory inspector or obtaining a license, the present law compels all home-workers to obtain a license; manufacturers shall keep a list of all home-workers in their employ, which shall be presented on demand to the factory inspector; by similar laws in Illinois and Massachusetts, such lists are placed on file as public records, accessible to all who may wish to ascertain under what conditions goods are made.

The "Consumers' Label" is used to enlist the individual buyer in the work of the League, and its attachment to garments certifies that they have been made under clean and healthful conditions, guaranteed after investigation. These conditions are further insured by the agreement which the manufacturer using this label makes, which is, that all provisions of the State factory law shall be complied with; that the label is to be used only on goods manufactured by said manufacturers in said premises; that no child under sixteen shall be employed; that working-hours shall not exceed ten hours per day or sixty hours per week; that duly accredited representatives of the League shall be allowed to inspect said factory at any reasonable times, and that reasonable requests for improvement made by the League shall be complied with. Goods bearing the label will be advertised by the League, and the community urged to purchase such goods.

It will be seen that the work of the Consumers' League proceeds along lines supported by definite economic principles, especially that which emphasizes, in the relation of consumption to production, the moral duties involved for society and the individual. These duties have grown out of the principle that the consuming or buying public directs or controls the producer. It is assumed that economic reform is therefore most likely to come through the agency of the consumer, and the Consumers' League has taken up the work of educating the latter, so that he may best influence the producers to institute the needed reforms. How the organization has gone about this has already been told. In an essay on the principles of the League and the possibility of carrying them out, Mr. John Graham Brooks, the president of the association, quotes the manager of a large New York store as saying that this kind of work had unquestionably corrected real abuses which the employers would not have corrected themselves, at least for a long time. A beginning, only, has been made, the large merchants expressing themselves as being perfectly willing to use the labels and conform to stated conditions wherever there should be a general demand for them. They frankly acknowledge the sensitiveness of the trade to the demands of the buying public. The same influence is recognized by those who sell only union-made goods, the labels on which testify that the goods were made according to union conditions. This principle is also being applied, though not very successfully thus far, by the Audubon Society, which appeals to women

not to buy birds for decorative purposes, or hats decorated with birds. As the refusal by women to buy such hats would eventually stop the destruction of birds, so the general buying of goods marked by a League label insures clean and healthful conditions for those who work in their manufacture, and the patronage only of "white houses" would, in time, it is argued, drive other establishments also to seek the trade which goes to houses whose employees receive fair treatment.

CONSUMPTION. See TUBERCULOSIS.

COOK, JOHN MASON, head of the great Cook tourist agency, died in London, March 4, 1899. He was the son of Thomas Cook, who in 1841 began in England the excursions which led to the founding of the agency. He was born in Market-Harborough, Leicestershire, in 1834; was educated at schools in his native town and Leicester, and in 1856 entered the employ of the Midland Railway Company as superintendent of excursion traffic. Here he remained three years and then entered his father's tourist business, of which he afterward for many years was sole manager. He visited nearly every country in the world, establishing agencies and effecting arrangements to facilitate excursions, and to him the wonderful development of the agency is due. Besides the regular tours offered by the agency, it has arranged numerous excursions to every international exposition since 1850. During the last ten years of his life Cook passed much of his time in Egypt and the Levant. He personally made arrangements for the German Emperor's visit to Palestine in the fall of 1898; for the services rendered on this occasion by himself and his eldest son, Mr. Frank H. Cook, the Emperor conferred on them, respectively, the decoration of the Order of the Golden Crown of Prussia and of the Order of the Red Eagle. While conducting this tour Cook contracted an illness from which he never recovered.

COOPER, JOB ADAMS, ex-governor of Colorado, died January 24, 1899. He was born in Bond County, Ill., November 6, 1843. He served in the Civil War with the One Hundred Thirty-seventh Illinois Volunteers. In 1865 he was graduated at Knox College, and two years later was admitted to the bar. He moved to Denver in 1872, and in 1888 was elected governor of the State, as a Republican. At the close of his term of office he was made president of the National Bank of Commerce of Denver. For many years he was engaged in banking and stock-raising in Colorado.

COOPER UNION FOR THE ADVANCEMENT OF SCIENCE AND ART, occupies the block between Third and Fourth Avenues, south of Astor Place, New York City. The charter was secured by legislative enactment, February 17, 1857, and the carrying out of its provisions was made possible by the generosity of Peter Cooper. The institution has a well-equipped museum for the study of the arts of decoration and a library and reading-room. There are day and evening classes, with 40 instructors, in which art is taught in all its branches, the higher mathematics and physical sciences, stenography, typewriting, and telegraphy. All facilities are free. On December 20, 1899, Andrew Carnegie gave \$300,000 toward the endowment of a mechanics' art day school in Cooper Union. The families of Mr. Cooper and Mr. Abram S. Hewitt also contributed the sum of \$200,000 for the school, thus making its endowment \$500,000. The idea of the school is not to teach a trade, but to teach the use of tools. The new school, which will open in the fall of 1900, will provide for the instruction of 500 students. The permanent endowment fund of Cooper Union now amounts to \$1,718,047. Instruction is free. President, Edward Cooper; secretary, Abram S. Hewitt.

COPPER. The production for 1898 was:

Domestic copper.....	526,512,987 pounds.
<i>Imports.</i> —	
Fine copper in ore, entered for consumption	} 19,750,000 "
Fine copper in regulus, entered for consumption	
Bars and ingots	} 50,840,000 "
Old copper	
	597,102,987 pounds.
<i>Exports.</i> —	
Ingots and bars.....	291,955,905 pounds.
Estimated fine copper, contents of matte.....	5,420,000 "
	297,375,905 pounds.

The imports came chiefly from Canada and Mexico. The domestic production for 1899 (in part estimated) is 592,672,637 pounds.

The three important copper-producing States—namely, Montana, Michigan, and

Arizona—held the same rank in 1899, though exact figures of production are not yet available. The operations at Butte have been much hindered by important litigation between the companies there, and in Michigan, owing to the increased demand for copper, a number of old and some new properties were started up. Arizona probably shows the greatest increase, and may in the next few years develop some important properties, especially in the Grand Canyon region.

COREA, an Asiatic kingdom, tributary to China previous to 1895, has an area of about 82,000 square miles, and a population variously estimated at from 8,000,000 to 16,000,000 inhabitants. Recent statistics place the number of inhabitants at 10,528,937. The capital, Seoul, has 200,000 inhabitants. The foreign population in 1897 numbered 10,000 Japanese, 4000 Chinese, and about 3000 other foreigners, of whom 130 are Americans and 73 British. For many years little was known concerning Corea, and even to-day the interior is largely an unknown country, both as regards the people and the nature of the soil. The country, however, is gradually being opened up. The agitations of the past few years, which brought about the nominal independence of Corea, have also awakened that country in part from its conservatism and lethargy. Corea stands as one of the most interesting, though one of the smaller, countries of Asia. China is watching the fate of Corea in fear of her own future, and Russia's designs on Corea are noted by England and Germany. The most interested of all is Japan, to whom Corea is the natural complement, and a country useful as an agricultural provider for Japan as that nation becomes more and more the industrial power of the East. The future prosperity, not only, but the independence of Japan would be threatened should the splendid ports of Corea, which command the Japanese and Chinese coasts, fall into Russia's hands and be used for the mobilization of native Russian armies.

Commerce and Agriculture.—The commerce of Corea received a set-back in 1898 by the shortage in rice crops, one of the staple productions of the country. This is shown by the United States Consular Reports for July, 1899, in which the total trade for 1898 is placed at 17,527,864 yen (\$8,763,932 gold) against 23,511,350 yen for 1897, a loss for the year of 5,983,486 yen, or \$2,991,743. The short crop in rice really occurred in the previous summer of 1897, but the scarcity apparently had not been made up by the generous crops of 1898, and the people seemed inclined not to part with their food supply as readily as in former years of plenty. This falling off in trade is probably but temporary, since commerce has steadily increased in Corea for some years in all branches. American imports to the value of over 1,270,075 yen, or \$635,038, were brought to Corea in 1898, an increase over 1897 of more than \$200,000. The principal items were railroad material, \$297,862, and kerosene, \$189,380. Manchester sheetings are being largely replaced in Corea by Japanese cotton yarns, which are woven by the Korean women on their hand looms at home. As the labor of women is not considered of any value, a more durable cloth is obtained for less money than would be obtained for the imported article. The importation of cotton yarns from Japan, besides rendering possible a cheaper native cloth for Corea, signifies the part that Japan will soon play as an industrial competitor in the East of European and American manufacturers. The import into Corea of shirtings and sheetings for 1898 is estimated to be 500,000 pieces. The United States Consular Reports for July, 1899, state that from reliable data it is estimated that within a few years Korean imports will show a percentage of 90 per cent. Japanese yarns to 10 per cent. sheetings and shirtings, instead of just the opposite, as has lately prevailed. Announcement was made by the Korean government in May, 1898, that four new ports, making ten such in all, were to be opened to foreign trade and residence. These were Kuhn San, on the west coast, south of Chemulpo; Masampo, on the southern end of the peninsula, near Fusan, and an obscure place called Sungchin, on the east coast; while the northern capital, Peng Yang, whose port of entry, Chenampo, had been opened the previous year, was to be opened as a trade mart. The date for the formal opening of these ports was officially announced as May 1, 1899. The mercantile apathy of the Koreans is very great, and the rich markets of their country are largely in the hands of the Chinese and Japanese. These nationalities have acquired so much real estate through the foreclosure of mortgages, obtained through credit to the Koreans, that the Korean government has begun to object to recording title deeds, lest the capital city of Seoul and other places slip entirely into the hands of these foreigners.

Productions and Industries.—The various industries connected with whaling, coal and gold mining, railroads, and trolley lines have attracted the most attention in Corea recently, and several, especially the electric trolley, are sufficiently remarkable in that backward country to call for a larger mention than can be given here. In connection with the discussion of the foregoing subjects it may be said, in general, that akin to the feeble commercial instincts of the people is the reluctance with which they allow other people to do what they themselves cannot or will not do. Their natural conservatism and their recent introduction to the outside world,

together with the betrayal of trust by foreigners, who have been favored in the past, are the principal causes of this attitude. Thus, when a foreigner asks for a right to develop some interest in Corea, he is immediately looked upon with suspicion. Recent efforts to obtain concessions for mining the large unworked deposits of coal in Corea have failed as signally as similar efforts in the past, while the Corean continues to use wood and grass for fuel, together with decayed surface coal. The existence of these important coal deposits may yet play a part in the political future of Corea. During the year 1898 a concession was granted to an English syndicate for a gold-mining district, to be worked for a period of twenty-five years, upon terms similar to those of the American and German concessions—that is, a payment of one-fourth the net proceeds to Corea. The American company's mines include the whole district of Woon San, 1000 square miles, and employ nearly 40 Americans and about 1200 Coreans. The company works 20 stamps, and 40 stamps more from the Union Iron Works are being erected. Among other concessions, a Russian company has received a license to catch whales and to bring them into one of three ports on the east coast of the peninsula, for the purpose of cutting them up for shipment. The Russians salt the blubber and flesh, and sell it at good prices in Japan, where it is largely consumed as food. Some 2,031,000 pounds of whale-flesh were imported into Nagasaki alone during 1898, valued at 112,940 yen, or \$56,470 gold. The Coreans themselves are indifferent fishermen and neglect this industry. The political aspects of this Russian concession are discussed under Recent History. Among the most interesting events, not only of the year, but of the entire history of Corea, is the practical completion of the first steam railroad and of the first electric trolley-line in the country which for centuries had closed its doors to the whole civilized world. The first is the Seoul-Chemulpo Railway, a road 25 miles in length, standard American gauge, connecting Seoul, the capital of Corea, with Chemulpo, the chief port of the country. This road was built for the American concessionaire, James R. Morse, at a cost of \$1,500,000 gold, and includes a large iron bridge over the Hans River, costing \$190,000. The road was built by American engineers, and the materials and equipment are almost entirely from America. It was sold by Mr. Morse on December 31, 1898, to a Japanese syndicate, and is nearly completed. The Japanese have a concession for a railroad, in addition, to connect Seoul with Fusan, to cost from \$12,500,000 to \$25,000,000. The road will be broad gauge and the distance about 400 miles. The road may be bought by the Corean government on appraisement after 15 years of operations. Much of the equipment for this road also will probably be purchased in the United States. The American contractors who built the Seoul-Chemulpo railway have also completed the construction of the overhead trolley electric street railroad, some six miles in length, in Seoul, the materials for which came from America and Japan. It was feared that the running of the first car on this road would be the signal for a demonstration by the superstitious natives, but the latter are said to have taken kindly to the new method of transportation, and regularly patronize the line. The productions of Corea, including rice, wheat, beans, barley, millet, oats, and other grains, tobacco, and ginseng, play an important part in the life and trade of the country. Besides the conditions affecting rice in 1897-98, already alluded to, it is reported that abnormally dry weather in the spring of 1899 produced a famine which caused considerable disturbance among the starving populace in the country districts.

Recent History.—The principal political happenings reported for the years 1898-99 concern in the main the rivalry between Japan and Russia for influence in Corea, and the continuation within the kingdom of the struggle between the Progressive party and the native rulers. In order to gain a clear idea of the Russian-Japanese influences in Corea, it may be recalled that after the Chino-Japanese war, which resulted in the relinquishment of the suzerainty of China over Corea and the nominal acknowledgment of the latter's independence, the dominating influence in Corea was Japanese. Japan professed to be willing to leave the country as soon as the Corean government should be able to restore order out of the disturbed conditions following the war, but troops were stationed there to protect the Japanese consulate and subjects, and a new cabinet was formed under Japanese influence. In the revulsion following the reforms instituted by Japan—a state of disorder believed by many to have been secretly stirred up by Russia—occurred the assassination of the Queen and the flight of the King to the refuge of the Russian legation at Seoul. Some of the ministers were arrested and beheaded, the rest fleeing to Japan, and the King formed a new cabinet under the influence of the Russian government. Russia's influence was in the ascendancy for only a short time, owing to the firm hold acquired on the country by Japan. The Independent Club, for the defence of the people's rights against the oppression of the Corean authorities, was formed about this time, and forced the King to dismiss the Russian officials from the government service. It also prevented the lease to Russia of Deer Island, commanding Fusan harbor. Russia, however, before retiring, formed an agreement with Japan by which the two powers were to advise the reduction of Corean expenditure, and

were to leave that country as soon as the financial and economical situation would permit them to do so. Almost immediately afterward, in the following year, Russia broke faith and forced Corea practically to place her finances and army affairs under Russian control. England stepped in, and, by means of a naval demonstration, compelled Russia to reinstate the former Korean customs and financial agent, a British subject, and Japan backed up, by a mobilization of her forces, her demand for the annulment of the new Russo-Corean agreement, and a more definite arrangement with Russia respecting Corea. These combined demonstrations resulted in 1897 in a settlement with England, and in 1898 Russia and Japan mutually agreed to recognize the sovereignty and complete independence of the Korean kingdom. Neither was directly to interfere in the government, and in case of a request for assistance from Corea, neither power should take active steps without consulting with the other. Russia, in recognition of Japanese progress and settlement in Corea, promised to do nothing to injure her commercial or industrial relations there.

The year 1899 closed with the Japanese influence in Corea again in the ascendancy over that of Russia, the rivalry between the two powers having continued notwithstanding the Russo-Japanese agreement of 1898. The dictatorial reform methods of Japan in 1895 and the harshness of the Russian officials after the flight of the King, had successively affected the respective ascendancies of Japan and Russia, and in 1898 the rival forces reached a somewhat even balance. But early in 1899 came the news that Russia was to be given the lease of three ports on the eastern coast of Corea to be used by the Russian whale fisheries mentioned above. This seemed at first to indicate the growing power of Russia, especially as the rumor of Russian railways to connect these ports with Vladivostock indicated a permanent hold in Corea. But the existence of Japanese prestige was evidenced by the restrictions placed by the Korean government, at the instance of Japan, upon the concession of these whaling stations. Instead of each station being 15 miles long, as asked by Russia, each is to be 700 feet by 300 feet, and for whaling purposes only, on a lease of twelve years, under the supervision of the maritime customs, Korean rights being safeguarded. The Japanese have been promised similar concessions. It is evident that relations between Japan and Russia are still far from harmonious. Toward the end of the year there were reports of coming trouble, it being alleged that to preserve autonomy in Corea or to prevent Corea's absorption by Russia, Japan would even fight. Such talk appeared to be confined to the press and magazines, but the belief is held by many that Russia—who has in pursuance of her ambitious designs in the east advanced to the very doors of Corea—is waiting only for an opportunity for the ultimate absorption of the kingdom. As an instance, the seizure of the reins of the impotent Korean government in 1897 and their apparently contemptuous release in 1898 is quoted "as a hand thrown out to feel the pulse of the powers." Internal affairs in Corea in 1899 were not promising. In March the cabinet was dismissed and two of the ministers banished. The efforts of the Independent Club to bring about reforms led the Korean Emperor, late in 1898, to order its disbandment. Then the People's Union was formed, and it demanded the re-establishment of the former organization, the punishment of what it termed the Emperor's bad advisers, and the enforcement of the new laws and regulations. Meanwhile the anti-progressives had formed the Peddler's Club, said to have been made up of some of the worst elements of the country, including bandits. This organization came to blows in Seoul one day with members of the Independent Club, but although they were aided by the police and soldiers, they were decisively beaten by the Independents. In June some members of the Progressive party showed their progressiveness by attempting to remove their leading opponents by blowing them up with dynamite. Previous to the latter event the government had caused the arrest of a score or more of prominent Independents for alleged complicity in a plot to unseat the Emperor and declare a republic. At the trial, which was to have been secret, several thousand sympathizers forced their way into the court-room, and the court, seeing that it would be impossible to convict the prisoners illegally before the eyes of so many people, merely set them free without any trial. Imperial decrees dissolving the People's Union also being without effect, its assembly, as soon as the government found it really had no European backing, was dispersed by force of arms. Recently the Emperor has ruled absolutely and with much severity, forbidding any public meetings. One result of this policy has been the emigration of thousands of the inhabitants across the borders of Manchuria and Siberia, and nearly all of these are said to have become naturalized Russians. As they keep up some intercourse with their relatives in Corea, the knowledge of Russia is being increased and Russian influence has found a new opportunity for growth.

COREY, CHARLES HENRY, D.D., Baptist clergyman and president of the Richmond (Va.) Theological Seminary, died at Seabrook, N. H., September 5, 1899. He was born at New Canaan, N. B., December 12, 1834; in 1858

he was graduated at Acadia College, Nova Scotia, and subsequently at the Newton (Mass.) Theological Seminary. Just before the Civil War he was ordained to the Baptist ministry, and was called to a charge at Seabrook, N. H. He soon resigned, however, and joined the Army Christian Commission, with which he served throughout the war. In 1867 he became principal of the Augusta (Ga.) Institute, and in 1868 was called to the presidency of the Richmond Theological Seminary for the training of colored ministers. He retained this position to the time of his death. Dr. Corey wrote *Reminiscences of Thirty Years' Labor Among the Colored People of the South*.

CORN. The following table, published by the Department of Agriculture, division of statistics, shows the acreage, production, and value of corn in the United States in 1899:

States and Territories.	Acreage.	Average Yield per Acre.	Production.	Average Farm Price per Bushel Dec. 1.	Farm Value December 1.
	<i>Acres.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Cents.</i>	<i>Dollars.</i>
Maine.....	11,873	86	437,428	50	213,714
New Hampshire.....	25,014	39	975,546	49	478,018
Vermont.....	47,526	36	1,710,986	47	804,140
Massachusetts.....	40,264	36	1,449,504	51	739,247
Rhode Island.....	8,116	31	251,596	53	133,346
Connecticut.....	46,149	39	1,799,811	50	899,906
New York.....	503,389	31	15,606,059	45	7,022,277
New Jersey.....	254,816	39	9,937,824	40	3,975,130
Pennsylvania.....	1,337,996	33	40,355,872	41	16,504,908
Delaware.....	206,696	23	4,547,812	34	1,546,066
Maryland.....	590,076	23	13,568,453	36	6,682,476
Virginia.....	1,744,045	20	34,890,900	28	13,254,732
North Carolina.....	2,457,986	13	31,953,168	47	15,017,969
South Carolina.....	1,857,021	9	16,713,189	50	8,356,594
Georgia.....	3,949,479	10	32,494,790	50	16,247,356
Florida.....	509,337	10	5,093,370	53	2,699,486
Alabama.....	2,751,260	12	33,015,120	47	15,517,106
Mississippi.....	2,440,223	16	39,043,712	46	17,960,108
Louisiana.....	1,438,707	18	25,896,736	44	11,394,559
Texas.....	4,508,411	18	81,151,398	36	29,214,503
Arkansas.....	2,404,357	20	48,087,140	38	18,273,113
Tennessee.....	2,999,888	20	59,997,760	39	23,599,126
West Virginia.....	693,964	26	18,043,584	45	8,119,613
Kentucky.....	2,037,747	21	55,392,687	37	20,496,394
Ohio.....	2,751,356	36	99,043,816	30	29,714,645
Michigan.....	1,059,054	25	26,476,350	27	9,531,426
Indiana.....	3,738,963	26	141,858,594	27	38,300,300
Illinois.....	6,865,287	26	247,150,832	26	64,259,046
Wisconsin.....	1,191,039	35	41,696,365	30	12,505,910
Minnesota.....	944,564	33	31,171,272	24	7,481,105
Iowa.....	7,814,511	31	243,249,841	23	55,717,463
Missouri.....	6,265,964	26	162,915,064	30	48,874,519
Kansas.....	8,800,786	27	237,621,222	25	59,405,306
Nebraska.....	8,018,331	28	224,513,268	23	51,606,853
South Dakota.....	1,154,516	26	30,017,416	26	7,804,528
North Dakota.....	24,065	23	553,495	23	128,653
Montana.....	1,583	23	36,396	52	18,921
Wyoming.....	2,453	22	53,944	43	23,196
Colorado.....	171,364	17	2,911,488	43	1,251,940
New Mexico.....	24,015	20	480,300	56	278,574
Utah.....	8,134	20	162,680	59	95,981
Washington.....	5,586	23	128,478	55	70,663
Oregon.....	13,519	23	307,418	64	190,348
California.....	56,925	27	1,536,975	60	923,185
Oklahoma.....	583,335	19	10,133,365	30	2,026,673
United States.....	82,108,587	25.3	2,078,143,983	30.3	629,210,110

The following statistics of the world's production are taken from the *Crop Reporter* for December, 1899, which is published at Washington by order of the secretary of agriculture:

COUNTRY.	1894.	1895.	1896.	1897.	1898.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
United States.....	1,212,770,000	2,151,138,000	2,283,175,000	1,902,968,000	1,924,185,000
Canada (Ontario).....	16,788,000	25,602,000	24,890,000	25,441,000	24,181,000
Mexico.....	77,273,000	71,906,000	76,264,000	121,868,000	100,000,000
Total, North America.....	1,306,831,000	2,248,646,000	2,384,269,000	2,050,237,000	2,048,366,000

COUNTRIES.	1894.	1895.	1896.	1897.	1898.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
Chile	5,000,000	9,000,000	9,000,000	8,000,000	9,982,000
Argentina	16,000,000	72,000,000	80,000,000	40,000,000	54,000,000
Uruguay	5,252,000	5,840,000	5,000,000	4,000,000	4,000,000
Total, South America.....	26,252,000	86,840,000	94,000,000	52,000,000	69,982,000
France	27,419,000	26,163,000	30,426,000	30,401,000	30,000,000
Spain	19,085,000	15,714,000	18,252,000	17,000,000	18,000,000
Portugal	15,000,000	15,000,000	15,000,000	15,500,000	15,500,000
Italy	59,608,000	70,488,000	79,910,000	65,891,000	76,192,000
Austria	13,795,000	18,730,000	17,492,000	14,757,000	16,074,000
Hungary	68,448,000	142,743,000	130,866,000	102,229,000	127,639,000
Croatia Slavonia.....	12,092,000	17,454,000	17,617,000	14,162,000	17,500,000
Total, Austria-Hungary.....	94,335,000	178,917,000	163,975,000	131,158,000	161,213,000
Roumania	29,892,000	71,323,000	66,428,000	79,753,000	101,870,000
Bulgaria and E. Roumelia.....	8,000,000	8,000,000	6,400,000	5,000,000	7,000,000
Servia	17,414,000	17,000,000	16,000,000	16,000,000	17,000,000
Russia	22,275,000	31,693,000	28,773,000	51,966,000	47,918,000
Total, Europe	294,023,000	434,298,000	419,164,000	412,669,000	474,693,000
Algeria	322,000	493,000	451,000	450,000	533,000
Egypt	38,000,000	33,600,000	34,000,000	35,000,000	32,000,000
Cape Colony	2,761,000	2,378,000	1,650,000	2,761,000	2,061,000
Total, Africa	35,083,000	36,471,000	36,101,000	38,211,000	34,394,000
Australasia	9,118,000	8,500,000	10,201,000	9,412,000	9,780,000

RECAPITULATION BY CONTINENTS.

North America	1,306,831,090	2,248,646,000	2,384,269,000	2,050,302,000	2,048,366,000
South America	26,252,000	86,840,000	94,000,000	52,000,000	69,982,000
Europe	294,023,000	434,298,000	419,164,000	412,669,000	474,693,000
Africa	35,083,000	36,471,000	36,101,000	38,211,000	34,394,000
Australasia	9,118,000	8,500,000	10,201,000	9,412,000	9,780,000
Total	1,671,307,000	2,814,750,000	2,943,735,000	2,562,594,000	2,637,165,000

A few countries besides those enumerated in the table produce corn, but statistics therefor are not available, and from a commercial point of view are not important, since the product of these countries is entirely for domestic consumption. Among these are Central America, the South American republics, except those named above, and India. The crop of Central America is probably considerably larger than that of Cape Colony. The acreage under corn in British India is between 5,000,000 and 6,000,000 acres, but the yield is unknown.

CORNELL UNIVERSITY, at Ithaca, N. Y., began its work in 1868. On January 9, 1899, President Schurman was asked by President McKinley to accept the chairmanship of a commission to visit the Philippine Islands, and Professor T. F. Crane was elected by the board of trustees to perform the duties of president of the university during his absence. President Schurman returned August 21, 1899. The year was chiefly notable for the organization and opening of the following new colleges and departments: The Medical College in New York City, opened October 4, 1898, with 278 students, of whom 26 were women, and a staff of 71 instructors. There were classes in each of the four years of the course, and at the first annual commencement, June 7, 1899, 76 students were graduated, 11 of whom were women. The new Medical College building on First Avenue, opposite Bellevue Hospital, being erected by the munificence of Colonel Payne, has been at a standstill on account of the scarcity of steel. The number of students in attendance at the university was considerably increased by the opening of the Medical College. The New York State College of Forestry entered upon its first year of existence with 31 students. The college forest of 30,000 acres, bought by the Forest Preserve

Board for \$165,000, was transferred to the college April 1, 1899. It is located near Tupper Lake station. For the inauguration of the work and improvements in the college forest a working capital of \$30,000 has been granted. The infirmary, the gift of Dean and William H. Sage, opened on September 30, 1898, fully equipped for receiving patients, and 184 were admitted during the year. The departments of hydraulic engineering and railway mechanical engineering were also opened during the year. Another important feature was the establishment of a summer session of the university, taking the place of the summer school formerly held under the management of individual professors and instructors. During the year 12,456 volumes were added to the general library, of which 3300 were gifts. Ex-president White added 866 volumes to the White Historical Library, and the Law Library was increased by 1058 volumes. An extensive addition to Morse Hall and an enlargement of Sage Chapel were completed during the year. For statistics see UNIVERSITIES AND COLLEGES; see also PSYCHOLOGY, EXPERIMENTAL; and FORESTRY.

CORREA, Lieutenant-general M., Spanish soldier and statesman, died in Madrid, April 18, 1899. He was minister of war in the Sagasta cabinet during the Spanish-American war, and resigned his office in October, 1898. He became chief of the Queen Regent's military household, which position he held at the time of his death. At the outbreak of the war in the spring of 1898 he delivered a bombastic speech, extolling the prowess of the Spaniards and predicting American defeat.

COSTA RICA, the most southern republic of Central America, lying between Nicaragua and the South American republic of Colombia and the Caribbean Sea and Pacific Ocean. The capital is San José.

Area, Population, and Education.—The country comprises five provinces and two territories, the total estimated area of which is 23,000 square miles, and the population (1897) 294,940. Very few of the rural inhabitants are of pure European descent. The principal towns with approximate populations are: San José, 25,000; Cartago, 12,000; Alajuela, 10,000; Puntarenas, 8000; Heredia, 6050; Liberia, Santa Cruz, and Nicoya, each 5000; Limón, 4000. Immigration is encouraged by the government; the annual number of immigrants is about 1000, greater than that to any other Central American country. A boundary dispute with Colombia has been submitted to the arbitration of the president of France. There has also been a boundary dispute with Nicaragua.

Roman Catholicism is the state religion, but the principle of religious liberty prevails. There are few non-Catholics in the republic; in 1892 there were reported 2245 Protestants and 224 Buddhists. Public instruction is gratuitous, and not only nominally, but actually compulsory, the latter being an unusual state of affairs for a Latin-American country. Besides five institutions for higher education there are (1897) 327 primary schools, with an attendance of 21,913 pupils.

Government.—The constitution, adopted in 1870 and thereafter repeatedly amended, places the chief executive authority with a president, who is chosen by electoral colleges for a term of four years, and is assisted by a cabinet of four ministers, who direct the following departments: The interior; finance and commerce; foreign affairs, justice, education, and worship; and war and marine. The president is Señor Rafael Yglesias, who was re-elected in November, 1897. The legislative power devolves upon a house of representatives, the members of which are chosen by electoral colleges in the proportion of one representative for each 8000 inhabitants. Members of electoral colleges are chosen by popular vote; self-supporting citizens are legal voters. Besides local magistrates and inferior courts, there are a court of cassation, two appellate courts, and a supreme court.

Military service may be required of men between the ages of eighteen and fifty. The national militia is said to number 12,000 and the regular army in time of peace 600; the war footing is placed at 34,000. The government owns one gunboat and one torpedo boat.

Finance.—Customs and excise constitute the chief sources of revenue; the principal expenditures are for administration and the public debt. For the fiscal year 1897 the revenue and expenditure were 7,435,611 pesos and 6,697,327 pesos, respectively; for the fiscal year 1898 the revenue was 8,424,104 pesos and the expenditure 8,313,454 pesos. A later report, however, made by the president of the republic, placed the revenue for that year at 8,413,198 pesos and the expenditure at 8,060,655 pesos; according to the same authority, the revenue for the fiscal year 1899 was 8,424,103 pesos. The president also said that the financial condition of the country was not in a satisfactory condition. In 1898 the total foreign debt was \$10,194,270; the internal debt in 1897 was 1,116,784 pesos. Amortization of the foreign debt at the rate of \$48,660 (£10,000) annually will begin in 1917; the internal debt is under process of redemption. The par value of the peso is \$0.9732 United States currency;

the paper peso is worth about \$0.446. The Costa Rican government in October, 1896, determined upon the gold colon as the monetary unit, but the plan was not put into immediate operation. The congress by enactments of June 24, 1899, authorized the executive to negotiate a private loan not exceeding £200,000 (\$973,200), to be converted into the national gold coin. This coin, the colon, is valued at \$0.465. As security for this loan there were offered 60,000 ordinary shares of the Costa Rican Railway, owned by the nation. In 1896 there was a specie reserve of 1,250,000 pesos for a paper circulation of about 3,300,000 pesos. Circulating silver amounts to about 350,000 pesos.

Industries and Commerce.—The principal industry is agriculture, the two most important crops being coffee and bananas. The soil and climate are such as to allow the cultivation of almost any crop. The cacao and rubber industries are progressing and the rearing of cattle is important. The live stock in 1897 was valued at 12,695,065 pesos. Parts of the country are rich in gold, and silver also exists. Recently mining was said to have fallen off to a great extent, but in 1899 it was announced that gold exploitation was being carried on by several companies controlled by English, American, and French capital. In some mines improved modern methods obtain.

Coffee is by far the most important export; other exports are bananas, hides and skins, and cabinet woods. Cotton goods and other textiles and iron goods constitute the leading imports. In 1896 the imports and exports, gold valuation, amounted to 4,748,818 pesos and 5,979,727 pesos, respectively. The export of bananas began in 1880 with the shipment of a few hundred bunches, and in 1899 had increased, it is said, to about 3,000,000 bunches a year; the export for 1898 was reported to be 2,331,036 bunches. In 1894, 33.64 per cent. of the total imports came from the United States; in 1898, 44.8 per cent. Of the coffee export, about 80 per cent. is sent to Europe, 56 per cent. going to England. Of the "fine grades," there were exported in 1898, 18,329,263 kilograms, of which England received 10,821,076 kilograms; the lower grades aggregated 1,156,862 kilograms, and the value of the whole export was \$4,209,569 gold. The imports and exports, gold valuation, for the year ending March 31, 1899, amounted to \$4,258,896 and \$5,659,218, respectively. The exports were divided as follows: Coffee, \$4,209,569; bananas, \$923,090; timber and dyewoods, \$345,439; precious metals, \$48,788; various exports, \$132,332. Of the coffee, Great Britain took 56 per cent.; the United States, 20 per cent.; Germany, 16 per cent.; about two-thirds of the bananas went to New Orleans and the remaining third to American Atlantic coast ports. The percentages of the imports by countries for 1898 were: United States, 44.8 per cent.; Great Britain, 19.6 per cent.; Germany, 15.6 per cent.; various, 20 per cent. According to a message of the president in 1899, exports and imports in United States gold have been as follows:

	1895.	1896.	1897.	1898.
Exports.....	\$5,188,401	\$5,597,727	\$5,474,773	\$5,659,218
Imports.....	3,851,460	4,748,812	5,460,944	4,258,896

Three steamers of 600 tons and two sailing vessels of 551 tons comprised the merchant marine in 1898. The arrivals at the ports of Limon and Puntarenas in 1896 were 476 vessels, aggregating 471,125 tons, and the clearances, 475 vessels of 473,929 tons. These vessels were British, United States, and German.

Communications.—The Caribbean port Limón is connected by rail with Alajuela, and the Pacific port Puntarenas with Esparta; the former line is 117 miles in length and the latter 14. A line connecting the inland terminals is under construction; also a railroad about 59 miles in length from San José to the proposed port of Tivives, at the mouth of the Gulf of Nicoya, is under construction. In 1899 the first electric tramway in Central America was built in San José, and other lines connecting the capital of neighboring towns were projected. In 1897 there were 917 miles of telegraph lines, with 43 offices; in the same year the post-offices numbered 83.

The only important seaport on the Atlantic coast is Limón, but on the Pacific there are several excellent harbors. The only one of the latter, however, that is at present frequented by foreign shipping is Puntarenas. Considerable improvements are being made to the harbor of Limón, and the expenditure therefor being incurred by the government. Near the close of 1899 the amount expended was reported to be about \$765,000. It is expected that the improvements will render Limón one of the most healthful ports in Central America. The work is being directed by an American contractor.

A Revolutionary Movement.—On February 25, 1899, an unsuccessful attempt to overthrow the existing government was made at San José by a small band of men under the leadership of a certain "General" Velarde. The insurgents were admitted

to the artillery barracks by Velarde's son, a lieutenant in the army. After some sharp firing, during which several were killed and wounded, the rebels were repulsed. Many arrests were made, but the elder Velarde escaped.

OOSTELLOE, BENJAMIN F. C., M.A., B.Sc., who died December 22, 1899, was a distinguished social reformer in England, and a pioneer of improved government for London. He was born in Ireland in 1855. His career had been notable from his school days. After graduating at Glasgow University, he entered Baliol College, Oxford. Later he became a university settler in the east end, where he worked unremittingly for the improvement of the tenement dwellers. He next helped to form the National Vigilant Association, an organization subjected to bitter criticism, but which succeeded in effecting many social reforms in London. He was elected to the first London County Council, of which he was a member until his death, and he was especially active during 1899 as a member of the important local government committee of the council. He was for several years a member of the executive committee of the London Liberal and Radical Union, and principal editorial writer for the *Daily Chronicle*. He was always closely identified with the movement for taxation of ground value. He was a Liberal candidate in 1885 for East Edinburgh, and later for East St. Pancras, but was unsuccessful in these political endeavors.

COTTON AND THE COTTON INDUSTRY.* The commercial crop of cotton in the United States for the season of 1898-99 was 11,256,000 bales, averaging 513 pounds (gross weight) per bale, against a crop of 11,216,000 bales, averaging 507 pounds per bale (gross weight) for the previous season. The figures are given by States in the accompanying table, together with the acreages. The corresponding figures for India are 15,612,000 acres for 1898, and 15,471,000 acres for 1899; and 2,534,000 bales of 400 pounds for 1898, and 2,787,000 for 1899. The acreage for Egypt is given as 1,350,000 in 1897-98, and 1,450,000 in 1898-99. The production is not given for Egypt, but the shipments from Alexandria were 843,000 bales in 1897-98 and 736,000 in 1898-99. The average price of middling upland cotton in New York for the season was about 6 cents per pound, being $\frac{1}{4}$ cent less than in the previous season. Mr. Thomas Ellison, of Liverpool, estimated British consumption for the year ending September 30, 1899, as 3,519,000 bales, of 500 pounds net, and continental consumption as 5,086,000 bales, of 500 pounds net, the latter being 208,000 bales more than the previous season. United States consumption for the season ending August 31, 1899, is estimated as 3,582,000 bales, of 500 pounds net, being 660,000 bales more than for the year before. Of this increase, 447,000 bales were consumed in the Northern mills, and 213,000 bales in the Southern mills. This large increase is due both to the greater number of spindles in operation, and to the fact that the mills of the country were worked to their full capacity for most of the time. The cotton mills of India consumed during the year ending June 30, 1899, 1,675,000 bales, of 392 pounds, being 194,000 bales more than the previous year. The cotton-consuming countries of the world from which reliable statistics are obtainable have consumed 1,110,000 bales, of 500 pounds net, more than during the previous season.

Estimated cotton acreages and crops, in bales, for the seasons 1897-98† and 1898-99‡. (Compiled from *Cotton Facts*, by A. B. Shepperson.)

	ACREAGE.		CROP, IN BALES.‡	
	1897-98.†	1898-99.†	1897-98.	1898-99.
North Carolina.....	1,302,437	1,811,708	615,000	600,000
South Carolina.....	2,074,779	2,353,313	950,000	950,000
Georgia.....	3,587,701	3,535,205	1,614,000	1,570,000
Alabama.....	2,708,460	3,008,176	1,150,000	1,180,000
Mississippi.....	2,778,610	2,800,296	1,600,000	1,500,000
Louisiana.....	1,245,400	1,281,691	725,000	600,000
Texas, Ind. T. and Okla. T.....	7,699,302	7,522,708	3,158,000	3,850,000
Arkansas.....	1,619,785	1,679,467	950,000	860,000
Tennessee.....	967,077	896,722	325,000	300,000
Va., Mo., Ky., Fla.....	385,040	286,112	118,000	96,000
Total United States.....	24,319,590	24,967,295	11,216,000	11,256,000

* Summarized from *Cotton Facts*, December, 1899. A. B. Shepperson, Cotton Exchange, New York City, author and publisher.

† Estimated by United States Department of Agriculture, Report of June 10, 1898, for the 1897-98 figures and Revised Report of December 9, 1899, for the 1898-99 figures.

‡ Estimated by Mr. Shepperson. The gross weight of the bales in 1897-98 was 507 pounds and in 1898-99 it was 513 pounds.

Number of cotton spindles and annual consumption of cotton in Great Britain, continental Europe, the United States, and India, for the past ten years. (From Cotton Facts, by A. B. Shepperson.)

NUMBER OF SPINDLES AT WORK IN COTTON MILLS.						
SEASON OF	Great Britain.	Continental Europe.	Northern States of United States.	Southern States of United States.	Total in United States.	India.
1888-89.....	43,500,000	24,885,000	12,700,000	1,360,000	14,060,000	2,768,000
1889-90.....	43,750,000	25,460,000	12,800,000	1,605,000	14,405,000	3,274,000
1890-91.....	44,750,000	24,035,000	12,900,000	1,740,000	14,640,000	3,352,000
1891-92.....	45,350,000	24,435,000	13,250,000	1,950,000	15,200,000	3,402,000
1892-93.....	45,270,000	24,850,000	13,450,000	2,100,000	15,550,000	3,578,000
1893-94.....	45,190,000	27,350,000	13,500,000	2,300,000	15,700,000	3,650,000
1894-95.....	45,400,000	24,250,000	13,700,000	2,400,000	16,100,000	3,810,000
1895-96.....	44,900,000	29,350,000	13,800,000	2,850,000	16,650,000	3,983,000
1896-97.....	44,500,000	30,350,000	13,900,000	3,250,000	17,150,000	4,066,000
1897-98.....	44,900,000	31,350,000	13,900,000	3,550,000	17,450,000	4,260,000
1898-99.....	45,400,000	32,500,000	14,150,000	3,950,000	18,100,000	4,728,000
Actual increase since 1889.....	1,900,000	7,615,000	1,450,000	2,590,000	4,040,000	1,965,000
Percentage of increase since 1889.....	4½%	30½%	11½%	190½%	28½%	71%

ANNUAL CONSUMPTION OF COTTON IN COTTON MILLS. (In Bales of 500 pounds net.)						
1888-89.....	3,016,000	3,256,000	1,721,000	445,000	2,166,000	711,000
1889-90.....	3,227,000	3,432,000	1,688,000	501,000	2,189,000	806,000
1890-91.....	3,384,000	3,631,000	1,701,000	550,000	2,251,000	943,000
1891-92.....	3,181,000	3,640,000	1,815,000	616,000	2,431,000	983,000
1892-93.....	2,866,000	3,692,000	1,762,000	660,000	2,422,000	937,000
1893-94.....	3,333,000	3,848,000	1,648,000	639,000	2,287,000	978,000
1894-95.....	3,250,000	4,030,000	1,813,000	806,000	2,619,000	1,074,000
1895-96.....	3,276,000	4,160,000	1,630,000	840,000	2,470,000	1,137,000
1896-97.....	3,224,000	4,368,000	1,771,000	946,000	2,717,000	1,041,000
1897-98.....	3,432,000	4,628,000	1,771,000	1,151,000	2,922,000	1,185,000
1898-99.....	3,519,000	4,836,000	2,218,000	1,364,000	3,582,000	1,340,000
Actual increase since 1889.....	503,000	1,580,000	497,000	919,000	1,416,000	629,000
Percentage of increase since 1889.....	16½%	48½%	29%	206½%	65½%	88½%

The figures do not include about 250,000 bales of cotton now grown annually in the Asiatic provinces and used in Russian mills; nor about 825,000 bales (500 lbs. net) spun by hand machines in India; nor the small quantity of Egyptian and Peruvian cotton used in the United States.

The cotton manufacturers of Great Britain and the United States have had the most prosperous and profitable season for years. The wages of operatives in the New England mills have very recently been advanced 10 per cent. Northern and Southern mills alike are running full time, and in many cases overtime. On the continent, while the volume of business has been larger than ever before, the profits have been only fairly satisfactory. The number of spindles in operation is as follows: Great Britain, 45,400,000, being 500,000 more than last season; the continent, 32,500,000, or 1,150,000 more; the United States, 18,100,000, or 650,000 more; India, 4,728,000; making a total of 100,728,000 spindles in operation for the countries named. Detailed figures by countries and years for spindles at work in cotton mills and amount of cotton consumed are given in the accompanying table. During the first few months of last season cotton goods were lower in this country than ever before, but since December 1, 1898, prices have steadily advanced, until they are now about 50 per cent. higher than the lowest figures. During the year ending June 30, 1899, the exports from the United States of cotton cloths were 412,004,055 yards, against 270,507,818 yards for the previous fiscal year, being an increase of 52 per cent. The increase in value of these exports is practically made up of the increase to China, Cuba, Hawaii, and Puerto Rico. As usual, the bulk of the exports was uncolored cotton cloths, the division for the year 1899 having been as follows: Colored cloths, 108,-

940,972 yards, valued at \$5,221,278, and 303,063,083 yards of uncolored cloths, valued at \$13,748,619. The comparative total exports for 1897-98 and 1898-99, showing cloths and all other cotton manufactures, and also countries to which the goods were sent, are given in the accompanying table:

Quantities and values of annual exports from the United States of cotton goods of domestic manufacture, by countries, 1897-98 and 1898-99. (Compiled from reports of United States Treasury Department for *Cotton Facts*, by A. B. Shepperson.)

COUNTRIES TO WHICH EXPORTED.	YEAR ENDING JUNE 30, 1898.			YEAR ENDING JUNE 30, 1899.		
	Cloths—Colored and Uncolored.		All Other Cotton Manufactures.	Cloths—Colored and Uncolored.		All Other Cotton Manufactures.
	Quantity.	Value.	Value.	Quantity.	Value.	Value.
	<i>Yards.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Yards.</i>	<i>Dollars.</i>	<i>Dollars.</i>
Germany.....	487,387	43,096	190,041	257,145	28,545	208,846
Great Britain.....	10,765,645	726,284	380,089	9,951,404	628,445	430,978
All other Europe.....	1,545,831	100,755	73,828	1,294,944	83,642	108,887
Dominion of Canada.....	14,116,228	783,985	1,681,645	17,114,475	819,241	1,939,923
Central American States.....	8,496,741	396,510	214,246	12,555,879	521,192	216,067
Mexico.....	6,679,429	415,910	334,663	8,399,834	481,569	401,968
West Indies.....	16,492,051	*927,711	*128,784	33,805,377	†1,740,834	†222,437
Brazil.....	8,666,686	565,921	59,828	9,328,179	545,545	41,657
Chile.....	12,251,936	516,185	5,363	11,804,577	485,389	13,979
Other South America.....	20,220,451	1,084,357	109,537	31,109,558	1,476,745	150,702
China.....	115,492,797	5,195,845	7,582	247,487,800	10,801,494	21,928
Other Asia and Oceania.....	41,667,292	†1,959,540	†496,623	15,906,630	§895,100	§221,573
Africa.....	13,554,743	569,428	52,728	9,696,474	396,677	119,496
All other Countries.....	190,641	5,296	7,312	1,291,779	65,500	43,568
Total.....	270,507,818	13,290,823	3,733,299	412,004,055	18,969,897	4,597,017

Advices sent late in December indicate a commercial crop of about 9,500,000 bales from the Southern States for the season 1899-1900, a falling off of from 10 to 25 per cent. from last year's crop. In India there is also a great shortage. A prominent Bombay firm reports, November 17, 1899, that the receipts into Bombay thus far are estimated at only 840,000 bales, against 2,079,000 bales for the preceding season. Few of the Indian mills are working more than four days out of the seven for lack of cotton. The Egyptian crop, however, will be about 100,000 bales more than last season. An examination of the progress of cotton manufacture in the leading countries of the world (see table) will show a marked growth in our Southern States and in India. The increase in the Southern States may be accounted for, in part, by the following advantages possessed by them: Proximity to the cotton fields, saving cost of transportation; comparative cheapness of land, material, fuel, and labor; length of working day. The chief significance of the increase in India is the fact that just as the consumption of the Indian mills increases, the quantity of the cotton crop left for export to Europe is diminished, thus making European spinners more dependent on American cotton. Perhaps the most suggestive feature in the figures is the fact that the greatest relative increase in cotton manufacturing is in the localities where the cotton plant is grown. Eventually the mills near the cotton fields seem likely to manufacture practically all except the higher grades of yarns and goods. The percentage of increase in consumption of cotton by the mills was uniformly greater than the percentage of increase in spindles. This difference is especially marked in Great Britain, where the mills show an increase in consumption of 16½ per cent., while the number of spindles has increased only 4½ per cent. The difference is due to the greater efficiency of modern spindles and machinery, and the great extent to which new and improved machinery has been substituted for old. It should be added, also, that the British mills now manufacture, on the average, finer yarns and goods than formerly, and that therefore their progress is relatively better than would be indicated by comparison with other countries in the accompanying tables.

* Includes \$12,163 of cloths, and \$11,715 of other manufactures to Cuba; and \$2206 of cloths and \$1678 of other manufactures to Puerto Rico.

† Includes \$447,839 of cloths and \$112,580 of other manufacture to Cuba; and \$169,057 of cloths and \$28,203 of other manufactures to Puerto Rico.

‡ Includes \$104,575 of cloths and \$256,804 of other manufactures to Hawaii; and \$1904 of cloths to the Philippines.

§ Includes \$140,719 of cloths and \$324,206 of other manufactures to Hawaii; and \$1895 of cloths and \$1337 of other manufactures to the Philippines.

The manner in which American cotton is generally baled and pressed for transportation to the markets and mills is not only needlessly expensive and wasteful, but fails to protect the cotton from damage and theft. The bales are covered with jute cloth made of thread so coarse and loosely woven that while it adds unnecessarily to the weight of the bale, it does not protect the cotton. The bales are held together by steel bands, which still further increase the weight. The weight of the bagging and ties on a bale weighing 500 pounds is about 23 pounds. From the inflammable character of the bagging and the cotton itself when packed in the usual way, and the constant risk of fire from the friction of the steel bands on the bales, some of the passenger steamships refuse to carry cotton, and such exclusion of course tends to raise the freight rate on cotton. Other disadvantages of the common method of baling cotton are: High insurance rates, the square bales being classed as "extra hazardous;" the necessity of the bales being compressed a second time (usually at the nearest shipping point), so that a greater number of bales can be loaded in cars and vessels, this process involving many additional incidental expenses, such as drayage and storage; the excessive cost of handling the ordinary bulky bales at the mills. Two improved methods of baling cotton are in use. The American Cotton Company puts up cotton in cylindrical bales, 35 inches long, 22 inches in diameter, and weighing 270 pounds. They are covered with closely woven, light weight burlap, the weight of the covering being less than $2\frac{3}{4}$ pounds per bale. No bands or wires are used to secure the bales, for as the air has been pressed out of the cotton in putting up the bales, there is no more tendency to expand in any direction than there is in a roll of carpet. It is simply a continuous lap or roll of cotton. The cylindrical bale of the Planters' Compress Company is 36 inches long, 18 inches in diameter, and weighs 250 pounds. This bale is held together by wires passing from end to end through a small opening in the centre. It is covered with cotton duck, and the weight of the cloth and wire is about 3 pounds per bale. Most satisfactory tests have been made with each of these types of bales to show their power of resistance to fire. The other objections to the old-fashioned methods of baling are also obviated by the cylindrical bales described. Several other methods of baling cotton have been devised, but have not yet passed the experimental stage.

COTTON, Sir ARTHUR THOMAS, British general, retired, died July 24, 1899. He was born in 1803; was educated at Addiscombe College, and in 1819 entered the Madras Engineers. He first saw active service in the field in the first Burmese war, which ended with the capture of Rangoon. In 1854 he was promoted to the rank of colonel; in 1861 he was knighted for his services in developing the cotton industry of India, and in 1866 was created a knight commander of the Star of India. He became a general in 1876, and in the following year was retired.

COUES, Dr. ELLIOTT, American scientist, and former army officer, who died December 25, 1899, was one of the foremost ornithologists of the United States. It has been said that his *Key to North American Birds*, which has gone through many editions, and his check-list of birds were, with *Ridgeway's Manual*, as important contributions to ornithology in many ways as were the analytical field-book by Gray in botany and the hand-books by Dana in mineralogy and geology. He was born at Portsmouth, N. H., in 1842, and graduated from the academic department of Columbian University in 1861 and from its medical department ten years later. After graduation his alma mater conferred upon him the degrees of A.M. and Ph.D. His scientific life began in 1862, when he entered the United States Army as a medical cadet. He soon became assistant surgeon, which remained his rank thereafter. Wherever his army duties called him, he made exhaustive studies of the fauna and flora of the region. Several scientific papers resulted from his residence in Arizona and South Carolina. In 1873-75 he did considerable field-work while surgeon and naturalist to the United States Northern Boundary Commission, after which he was appointed to the Smithsonian Institution. In 1876 he became naturalist to the United States Geological and Geographical Survey of the Territories. In 1880, Dr. Coues was ordered to the frontier by the War Department, but he had become so deeply interested in scientific work that he resigned from the army and returned to Washington. He was at various periods professor of scientific subjects in several colleges, and was a member of the National Academy of Sciences. He was at one time interested in the investigation by scientific methods of the phenomena of spiritualism and telepathy. The results appear in a series of speculative works written on the origin and nature of life. The range of Dr. Coues's literary life was very great. He was the author of thirty-seven volumes and over a thousand articles to magazines and periodicals. One of his most important labors of recent years was his work for the *Century Dictionary*, to which he contributed some 40,000 definitions and words, in general biology, comparative anatomy, and all branches of zoology. He served six different scientific journals in editorial capacities, and his name was on the rolls of more than fifty foreign and American scientific societies. He was one of the founders of the

American Ornithological Union. His chief books are: *The Key to North American Birds*; *Check-List and Dictionary of North American Birds*; *Field Ornithology*; *Birds of the Northwest*; *Fur-Bearing Animals*; *North American Rodentia*; *Birds of the Colorado Valley*; *New England Bird Life*; *Biogen*; *The Dæmon of Darwin*; *Kuthumi*; *Can Matter Think? Buddhist Catechism*; *A Woman in the Case*; *Signs of the Times*; *Citizen Bird*. He also edited many papers, among them being *The Travels of Lewis and Clark*.

COWEN, FREDERIC HYMEN, who succeeded Sir A. C. Mackenzie as conductor of the London Philharmonic in 1899, is a well-known English composer. He was born in Kingston, Jamaica, in 1852. He studied under Sir Jules Benedict and Sir John Goss, and also in the conservatories of Leipsic and Berlin. In 1880 he became conductor of the Covent Garden Promenade Concerts; was conductor of the Philharmonic from 1888 until 1892, and in 1896 became conductor of the Manchester and Liverpool Philharmonics. His compositions include: *The Rose Maiden*, cantata, 1870; *The Corsair*, cantata, 1876; *Pauline*, opera, 1876; *The Deluge*, oratorio; *Saint Ursula*, cantata; *Sleeping Beauty*, cantata; *St. John's Eve*, cantata; *The Water Lily*, cantata; *Ruth*, oratorio; *Signa*, opera, Milan, 1893; *Harold*, opera, London, 1895; *The Transfiguration*, cantata; suites for orchestra, *The Language of Flowers* and *In Fairyland*; *Dream of Endymion*, scena for tenor; several symphonies, including *The Scandinavian*; *Ode to the Passions*, 1898; more than 250 songs, and numerous piano pieces and chamber music. Mr. Cowen visited Canada in 1899. In that year he was made president of the Northwest London Choral Society, founded in 1899, to study little-known works.

COX, ROBERT, M.A., Liberal Unionist member of Parliament, died at Aix-les-Bains, France, June 2, 1899. He was born at Edinburgh, May 6, 1845; was educated at Loretto School and at the universities of St. Andrew's and Edinburgh. Subsequently he became a well-known manufacturer in Edinburgh. From 1891 to 1895 he was vice-president of the Edinburgh Philosophical Institution; from the latter year to the time of his death he represented South Edinburgh in Parliament. Mr. Cox took a lively interest in open-air sports, and will be remembered by the golf players of America for presenting to the United States Golf Association the one-thousand-dollar silver and enamel cup for the women's golf championship of this country.

CRAMP, CHARLES HENRY, who was made president of the Philadelphia Commercial museums in 1899, was born May 9, 1828. He is the son of William Cramp, the ship-builder. He was graduated at the Central High School, and, learning the ship-building trade, became a partner of the firm of William Cramp and Sons, of which he is now president. This is the largest ship-building enterprise in this country.

CRANE, WALTER, painter, poet, and authority on decorative art, was born in Liverpool, England, August 15, 1845. He is the son of Thomas Crane, the artist, and was educated privately. In 1859 he was apprenticed to W. J. Linton, the wood-engraver, and in 1863 published *The New Forest*, the first of a long list of illustrated books, including *The Baby's Opera*, London, 1877; *The Baby's Bouquet*, 1879; *Pan-Piper*, 1882; *Grimm's Household Stories*, 1882; *the Sirens Three*, a poem, 1885; *Baby's Own Æsop*, 1886; *Flora's Feast*, 1889; *Queen Summer*, 1891; *Spenser's Faerie Queene*, 1895-97; *The Shepherd's Calendar*, 1897, and *The Bases of Design*, 1898. Mr. Crane is a member of various artistic societies in London, and in 1899 was one of the founders of the Pastel Society. He was associated with William Morris in his socialistic propaganda, and was the first president of the Arts and Crafts Exhibition Society, which post he still holds. Mr. Crane is examiner in design at South Kensington, and is an ardent advocate of a national institution of art. His principal pictures are: "The Renaissance of Venus," "Fate of Persephone," "Europa," "Freedom," "The Bridge of Life," "Neptune's Horses," "The Swan Maidens," "La Belle Dame sans Merci," "The Chariots of the Hours," "England's Emblem," "Britannia's Vision," and "The World's Conquerors."

CRANFORD, JOHN WALTER, representative from Texas, fourth district, in the Fifty-fifth Congress, died in Washington, D. C., March 2, 1899, in his thirty-seventh year. Born in Clark County, Ala., and educated in the high schools and privately, he removed to Texas about 1880, studied law, and was admitted to the bar. He was elected in 1888 and re-elected in 1892 to the State senate, serving for a time in that body as president *pro tem*. Cranford was elected to Congress, as a Democrat, in November, 1896, defeating Mr. J. H. Davis, Populist, and Mr. M. W. Johnson, Gold Democrat.

CREMATION OF THE DEAD. During the year 1899 several English municipalities have taken parliamentary powers to provide for public cremation, and in March, 1899, the corporation of Hull, England, was building a crematorium. Mayor

Quincey, of Boston, has suggested that a municipal crematory be established in which to incinerate the bodies of paupers and criminals, thus doing away with the Potter's Field. It is asserted that the city could cremate bodies at a cost of \$1 each, against \$3 to dig a grave. The public burials in Boston now amount to about 500 annually, and the Potter's Field is full.

In Paris cremation is compulsory for certain classes. In the furnace erected by the city in Père-la-Chaise, the city burns all unclaimed hospital dead, remains from dissecting tables, and dead bodies from streets and sewers. Berlin has a municipal furnace for disposing of parts of the human body, but they must be unidentifiable.

The accompanying table shows the rapid growth, both in numbers and in the use made of each, of private crematories in the United States, up to the close of 1898:

TABLE OF CREMATIONS IN THE UNITED STATES, 1876 TO 1898.

(Compiled by the United States Cremation Co. of New York.)

CREMATORIES.	1876, 1893.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	Totals.
New York-Fresh Pond, U. S. Cremation Co. (Ltd.).....	9	77	67	83	106	160	187	186	232	243	296	330	331	466	2773
Buffalo, N. Y.....	1	8	17	16	23	30	38	27	30	31	41	38	44	40	374
Troy, N. Y.....	4	10	14	15	12	10	18	14	13	110
Swinburne Island, N. Y.....	2	..	60	28	8	1	1	3	3	106
Waterville, N. Y.....	1	1	6	5	4	4	21
St. Louis, Mo.....	24	20	42	60	64	72	87	96	86	118	109	778
Philadelphia, Penn.....	14	28	31	51	62	68	74	88	85	78	114	693
San Francisco, Cal. (Odd Fellows).....	66	101	214	290	641
Boston, Mass.....	1	87	88	135	160	167	638
Cincinnati, O.....	11	21	34	45	43	34	42	38	66	46	71	59	510
San Francisco, Cal. (Cypress Lawn).....	42	111	88	70	54	65	430
Chicago, Ill.....	6	42	66	54	82	130	380
Los Angeles, Cal.....	7	5	12	17	29	41	37	38	37	37	34	58	352
Detroit, Mich.....	3	10	14	24	21	33	47	22	31	29	44	51	329
Pittsburg, Penn.....	14	9	11	8	9	13	14	13	10	13	14	16	167
Baltimore, Md.....	3	5	12	16	22	15	11	17	21	14	136
Lancaster, Penn.....	3	36	14	13	6	1	3	1	3	5	2	1	1	2	92
Davenport, Iowa.....	6	7	13	8	8	9	23	17	91
Milwaukee, Wis.....	21	34	30	85
Washington, D. C.....	25	38	63
Pasadena, Cal.....	4	14	24	55
Washington, Penn.....	25	13	1	1	..	..	..	..	..	..	..	2	..	..	..	..	42
St. Paul, Minn.....	2	11	13
Fort Wayne, Ind.....	5	1	6
Middletown, Conn.....
Totals.....	25	16	47	114	127	190	249	372	471	561	674	831	1017	1101	1391	1699	8885

Later figures for a few of the cities named in the table are as follows: During the first nine months of 1899 the Massachusetts Cremation Society burned 173 bodies at its crematory at Forest Hills. Of the decedents 90 were males and 83 females; 63 died in and 110 outside of Boston. The number of burial permits issued by the Board of Health of the city was 8976, against 63 permits for cremation. At Fresh Pond (New York City), 528 bodies were cremated during 1899, making a total of 3301 for the 25 years of the crematory's existence. The Philadelphia Cremation Society was organized in 1887 and incorporated in 1899. Over 100 cremations were made during 1899. The charge for cremation is \$35 for adults at both Philadelphia and New York; \$20 for children under 12 years at Philadelphia, and \$25 for children under 10 years at New York.

The objections to cremation are chiefly (1) religious and sentimental, (2) medico-legal. A large part of the clergy, including the Pope of Rome, are opposed to cremation. Custom and tradition are against the practice. Many prominent clergymen and public teachers, however, have recently declared in favor of this method, thus greatly modifying the prejudice against it. The medico-legal objection is that with incineration possible evidences of crime may be destroyed. The Cremation Society of England has met this objection by investigating the conditions of death in the case of everybody for whose incineration application is made, and has further secured the services of a distinguished pathologist for making necropsies when required. The chief arguments in favor of cremation are: (1) The crowding of the land, especially in and near large cities, with cemeteries. It has been estimated that 24 acres are annually required for the disposal of the dead of London. (2) Sanitary considerations. Sir Henry Thompson, in a recent address before the Cremation Society of England, contends that cremation, while remaining optional in case of

ordinary causes, should be obligatory where death is due to such transmissible diseases as small-pox, scarlet-fever, diphtheria, cholera, typhoid-fever, and tuberculosis.

CRETE, one of the largest islands of the Mediterranean Sea, lies to the south of the Ægean Sea and archipelago. It is about 150 miles long and from 6 to 35 miles in breadth, and its estimated area is about 3000 square miles. The character of the country is mountainous. The population of Crete has been placed at from 294,000 to 370,000 inhabitants, of whom the great majority are Greek Christians. The remainder, mostly Mohammedans, number about 70,000. The lower grounds of the island are fertile, and produce fruits, tobacco, cotton, silk, etc. The principal cities are Candia (population 25,000), Canea (population 15,000), and Retimo (population 9000).

Political Conditions.—Crete, the Cuba of the Mediterranean Sea, looked back, on December 21, 1899, after centuries of oppression, conquest, and civil war, upon the first year of freedom, under the rule of Prince George of Greece, the appointee of the four great powers, Great Britain, France, Russia, and Italy. The similarity between Cretan and Cuban affairs is quite close. Crete had long been an unhappy country, and the sympathy of Greece, although born in part by a race relationship with many of the island's inhabitants, was otherwise not unlike the feeling in America regarding Cuba. The intention of Greece in the Greco-Turkish war had been the annexation of Crete, while the United States had expressly stated an opposite intention as to Cuba; but the inhabitants of Crete were on the whole willing and in large numbers anxious to become the subjects of the Grecian king. In both Cuba and Crete years of misrule and of war have affected the character of the people. A large number of the Cretan people are ignorant and fanatical, and have grown quarrelsome through years of knowing no better state of affairs. In addition there are strong religious prejudices among the population, which have played an important part in the various troublesome times of the land. The powers interfered even before the Turkish war, to prevent the Grecian annexation of Crete, announcing that they themselves would be responsible for order in that island. When the time came jointly to appoint a high commissioner for Crete, Prince George of Greece was nominated, and his acceptance formally authorized by his father, the King of Greece. He took his office on December 21, 1898. While acknowledging the suzerainty of the Sultan of Turkey, he was to organize an autonomous government in co-operation with the general assembly, guaranteeing freedom of religion and security of life and property, and establishing a gendarmerie. Each of the four powers agreed to advance \$200,000, to be afterward repaid by the Cretan government. His rule during 1899 was consistent and even-handed, and resulted, in spite of the many difficulties in the way, in the best and most popular government that Crete has yet had.

Events Preceding the Reconstruction.—For twenty-five centuries, from the rule of the kings of mythology to modern times, Crete has been known as the seat of conquest and oppression. The island was held by the Romans long before the time of Christ, and on the division of the empire fell to the control of the East. It belonged subsequently to the Saracens, Pope Boniface, the Venetians, and others, and in 1669, after twenty-four years of war, was taken by Turkey. The island has never been entirely subdued to Turkey and revolutions have been frequent. In consequence of these, since 1868 various reforms have been forced from the Sultan, securing in form a fair degree of self-government to the island. The bad faith of Turkey in carrying out these reforms caused increasing discontent among the Christians, who enlisted the aid first of England and then of Greece. The latter, in 1897, during much fighting and disturbance stirred up among the Mohammedans by the Sultan, landed a force in the island. The interference of the powers caused the withdrawal of Greece. Then followed the fearful Moslem massacre of Christians, the collective note to the Sultan signed by Great Britain, France, Russia, and Italy, and the withdrawal of the Turkish troops. Soon after the appointment of Prince George was announced as high commissioner of Crete for three years.

Crete under Prince George.—The ability and enthusiasm of Prince George were wholly devoted during the year 1899 to the unique work of reconstructing the social and political affairs of Crete, and the results of these first twelve months are reported to be beyond expectation. He began his administration with the support of the great majority of Cretans, who felt themselves for the first time united in a common cause, under the rule of a governor of their own race and language. He was aided also by the prestige of the powers, to whom alone he is responsible, though under the nominal suzerainty of the Sultan. Thirdly, it is said, his personal attractions and his royal status and nationality, creating the Cretan hope of ultimate union with Greece, have contributed no small part toward the possibility of a strong and successful government. On the 7th of January a commission of 16 members, of whom 12 were Christians and 4 Mussulmans, was appointed to draw up a plan for a constitution. In the following week the Prince nominated a judiciary commission

composed of 4 members, including 3 Christians and 1 Mussulman, to draw up civil and penal codes. The chamber of deputies was assigned on the 5th of February. The newly drafted constitution was submitted to the national assembly, by which it was approved and passed, March 16, 1899. On February 22 the assembly had elected M. Sphakianaki as president. The government was empowered in April to raise a loan of 9,000,000 drachmas, on condition that the interest, with the help of the powers, should not exceed 3 per cent. Immediately afterward an administration consisting of a council of five members was formed. Early in May it was announced that the Italian government had provided 6 officers and 86 non-commissioned officers to organize the Cretan gendarmerie. The administrative council was formed as follows: Justice, M. Venezelo; interior, M. Kountoros; education and religion, M. Yamalaki; finance, M. Fomis; posts, telegraphs, and public safety, Hassan Bey Skylianaki. The financial advisor of the high commissioner, H.H. Prince George of Greece, is M. de Blovay. The task of securing for Crete good government and peace, after the years of misrule which have but just closed, finds among its chief difficulties the local religious conditions and the fierce intersectional jealousies, subjects already referred to in the introduction to this article. Foreign critics are not yet at all hopeful of permanent peace in the island, but the past year seems to show that a way has been found to overcome many of the causes which have hitherto promoted turmoil. Prince George in his inauguration speech called upon the patriotism of the people in forwarding the experiment of autonomy made possible by the powers, and in promising a just and liberal government he emphasized the impossibility of restoring peace to Crete without obedience to law and the cessation of quarrels about race and religion. His impartial rule has had its effect, and many Mohammedans even, especially those in the towns, and the rich land-owners, have recognized the sincerity of his efforts and have come to his support. He has not as yet been entirely successful with the bulk of the Mussulman minority, who have been induced, under the influence of secret agents of the Sultan, to emigrate in large numbers to Asia Minor, where they might live entirely under Moslem rule. Many of these had been driven from their homes in Crete during the period of unrest following the massacres, and they evidently doubted the good faith of Prince George in his statements that they should enjoy full equality with their Christian neighbors. As many as 30,000 abandoned Crete, although some of these are returning as they see the growth of order and good government in Crete. Meanwhile those still in Asia Minor are making trouble for Turkey, where they are clamoring for food and employment. A danger in connection with the movement is the suggestion by the Russian government to settle the Armenian refugees, who have been driven out by Turkey, in the localities formerly occupied by the Moslems in Crete. As the Greeks hate the Armenians, such a movement might result in further disorders in the island. See *ARCHÆOLOGY* (paragraph Greece).

CRICKET. The event in cricket circles for the United States in 1899 was the visit to this country of Prince Ranjitsinhji, the foremost cricketer of to-day, with a team of English amateurs. Next to the tour of the all-English team, one of the most interesting series of games was the annual United States-Canadian match. For a detailed account of these English and Canadian games see *SPORTS, INTERNATIONAL*. Philadelphia continues the stronghold of cricket in the United States. The Halifax Cup, representing the cricket championship of this country, was contested for by the principal Philadelphia clubs, and was secured by the Germantown team, with 12 won games out of 16. The standing of the other teams was: Merion, 6 games out of 10; Belmont, 6 out of 10; Philadelphia, 4 out of 11; Radnor, no victories. In the Metropolitan District (New York) League, cricket continued to develop. The summaries are: Knickerbocker Athletic Club (team A), 8 out of 10, 1 drawn; team B, 7 out of 10, 1 drawn; Manhattan, 5 out of 10, 2 drawn; Staten Island, 4 out of 10; New York, 4 out of 10; Newark, 0 out of 10. The pennant of the New York Cricket Association was won by Paterson, team A, 8 out of 10, 2 drawn. In these games, each playing 10, Kearny won 5, Brooklyn 4, Manhattan 2, Kings County 2, and Paterson, team B, 2. Manhattan had 4 drawn games, and the others 2 each. The Intercollegiate Cricket Association, composed of Harvard, Pennsylvania, and Haverford, gave the championship to Harvard again. The winner defeated Pennsylvania 91-35, and Haverford 96-38. Cricket developed greatly in 1899 on the Pacific coast.

CRIME. *The United States Census and Crime.*—Prior to 1850 no statistics of crime or prisoners appeared in the census. In 1850 the enumerators were required to ascertain whether the person counted was blind, insane, deaf and dumb, idiotic, a pauper, or a convict, and the population schedule in 1850 was substantially repeated in the census of 1860 and 1870, which therefore provided for statistics as to the number of prisoners. The returns as to convicts who were not inmates of penal institutions were necessarily defective, and the statistics collected in regard to the inmates of

such institutions were not tabulated. So the statistics of prisoners for the censuses previous to the year 1880 were not available from this source, and those which we have are based on the schedule of social statistics, one of whose questions was the number of prisoners in the locality. The vagueness of this question, which might include only persons convicted of crime or all inmates of penal institutions, even those awaiting their trial, rendered the prison statistics of the census previous to 1880 practically worthless. In 1880 the census provided for the collection of data not only as to the number of prisoners, but as to the cause of imprisonment, the nature of the offence, and the length of the sentence. In 1890 the statistics assumed a still wider scope, and the criminal schedule contained questions relating to occupation while in prison, employment at time of arrest, degree of education, residence, health, and use of alcoholic liquors. The statistics of prisoners in that census took up 511 pages of general tables. The treatment of crime in the Eleventh Census has been criticised by a recent writer on the following grounds:

- "1. It furnishes no basis for a calculation of the increase of crime.
- "2. In depicting the geographical distribution of crime, it favors one locality at the expense of another.
- "3. It exaggerates the number of male sex in the aggregate of crime.
- "4. It assigns to the negroes a larger, and to the foreign-born white a smaller, share in the total of crime than belongs to each.
- "5. It distorts the picture of the relative frequency of the different classes of crime."

The tabulation is criticised as wasteful in that it records a superfluous number of facts in regard to a comparatively small number of cases, and sometimes to a single case. It is criticised as defective in noting the occupations of prisoners prior to arrest. It summarizes them by groups which do not accord with the occupation tables of the census. These tables include data for which no data are given in regard to the general population, and this in the circumstances is of no use for purposes of comparison. A more serious defect is the grouping of certain phenomena according to the percentage of the total number of prisoners, and not according to the percentages of the corresponding classes in the population. An example which has been given of this is that in comparing the proportions of male and female prisoners, the latter are relatively more numerous in the higher age groups, which would seem to indicate a greater tendency on the part of women to commit crime as they advance in age, whereas the greater proportion of women to men in the general population renders this view untenable. The same sort of criticism has been applied to the statistics showing the ratio of prisoners to population in different sections, without regard to the proportional strength of age groups in those sections. Thus in the western section the ratio of prisoners to the total population is highest, but no account is taken of the fact that the proportion of adult males is also higher in that section. These are a few of the objections urged against the criminal statistics of the federal census of 1890. The main point, however, in a comparison between the criminal statistics of the United States and those of foreign countries is the fact that in the United States the statistics of the census apply to prisoners alone, whereas in many foreign countries they are based upon judicial proceedings, and prison statistics are a secondary source of information. It is urged that the movement of crime in a community cannot be determined from the movement of the prison population. A decrease in the prison population does not necessarily denote a decrease of crime, "since the daily average prison population depends upon the duration of sentences and not upon the amount of crime." In spite of these defects the criminal statistics of 1890 are the latest in the United States which cover the entire country. The number of prisoners in 1890 was 82,329, and the following table classifies them according to the crimes committed:

		Percentage.
Offences against the government.....	1,839	2.2
Offences against society.....	18,865	22.9
Offences against the person.....	17,281	21.0
Offences against property.....	37,707	45.8
Miscellaneous.....	6,637	8.1
Total.....	82,329	100.0

The number of convicts in the penitentiaries in 1890 was 45,233, or 722 convicts per million; in 1880, 35,538, or 709 per million. The absolute increase was thus 995, and the relative increase per million was only 13. Geographically the inmates of penitentiaries in the United States were divided as follows: North Atlantic Division, 14,477; South Atlantic and Central Divisions, 15,707; North Central and West-

ern Division, 15,049. As to sex, 43,442 were men and 1791 women. As to parentage, 14,725 were foreign born, 14,687 were colored, and 13,715 were native whites. The larger proportional number of criminals among the foreign born is almost wholly accounted for by the smaller proportion of children among them. The percentage of the native white prisoners to the total adult native white population was .19, while the percentage of the foreign white prisoners to the total adult foreign whites was .21. On the basis of the entire number of prisoners—that is, 82,329—the census attributes 57 per cent. of the crimes to the foreign element and 43 to the native white element. But this fact, like the ratio of the foreign-born convicts, is explained by the difference in age groups. While the foreign-born male prisoners were 26.2 per cent. of all inmates of prisons, the foreign-born males of an age at which crimes would be likely to be committed—namely, over eighteen years—were 26.38 per cent. of the total number of males of that age and over.

Recent Statistics.—No criminal statistics covering a sufficiently wide area to make them of practical value were available for 1899 in the United States, but a study of the prison statistics in several of the States seems to establish a marked decrease in the prison population beginning with the summer of 1898. In Massachusetts this decrease is in part attributable to changes in legislation, reducing the time for which prisoners held for non-payment of fines might be detained. Among the more general causes, the Spanish-American war has been cited, as drawing off an element in the population which was especially subject to temptation to commit crime. The improvement of business resulting in the more general employment of the working classes is mentioned as another factor, since the relation between crime and unemployment has been established. It must be noted, however, that this reputed decrease in crime is based upon the decrease in the prison population, which is not always a safe index. To be of much practical service the statistics should take note of the class of offenders which show a decrease. A large part of the decrease following the summer of 1898 was due to a falling off in the number of minor offenders. The law against petty offences varies in its execution from year to year, and this fluctuating stringency causes variations in the statistics which have no significance as to the general question of the increase or decrease of crime. An investigation was made in 1899 to ascertain the cost of crime to the State. The figures are given for Massachusetts, but are fairly typical for the whole country. It was estimated that the aggregate expenditure of that State amounted to \$745,000, or about one-half of the total State tax; that of the counties to about \$1,000,000, and that of the municipal governments at nearly \$3,000,000. The entire cost of police protection against criminals in Massachusetts was roughly placed at \$5,000,000, making the average cost of an arrest \$50 per prisoner, the average annual cost of keeping prisoners \$130 per prisoner, and the cost of providing buildings for prison inmates at from \$1200 to \$2500 per inmate. The apparent decrease of crime which was said to have begun in the summer of 1898 applies only to a short period of time. According to the report of the Massachusetts Prison Association there was a great increase in crime since 1883. In that year the number of arrests was 63,803, of commitments 24,125, and the average prison population for the year was 3893, while in 1898 the arrests numbered 99,336, the commitments 29,796, and the average prison population for the year 7654. An effort was made in 1899 to secure the passage of a bill which would place the county prisoners under State control with the view to classifying prisoners as to sentences, offences, criminal character, and ages, and introducing measures of reform for the improvement of prisoners, the introduction of uniformity in management and in terms of sentence, the better regulation of labor in the prisons, the more complete separation of sexes, etc. A commission recommended a bill which comprised these features, but the need of it was not perceived by the legislators and it was rejected.

For England and Wales the prison statistics since 1885 show a decrease in the number of persons committed on indictment, and an increase in the number committed on summary conviction. Of the former the average annual number during the five-year period ending March 31, 1885, was 9962, and the actual number for the year ending March 31, 1899, was 8315. This is a decrease of 16.5 per cent., and in proportion to the population of over 30 per cent. Of persons committed on summary conviction the average annual number for the five-year period ending March 31, 1885, was 149,046, and the actual number for the year ending March 31, 1899, was 151,744, an increase of 1.8 per cent., but, taken in connection with the increase in the population, these numbers represent a decrease of 14.6 per cent. It must further be noted that during this interval there has been a great increase in the number of quasi criminal offences, and that many of the convictions counted in with the figures for 1899 were for offences that did not exist in 1885.

Criminality and Marriage.—In the *Zeitschrift für Socialwissenschaft*, 1899, Printing has published the results of an investigation of the married state in its influence upon crime. From his statistics he concludes that married men respect property

rights more generally than single men; that they do not often commit the graver crimes against property, such as robbery or fraud; that they do not often commit offences against morality (except, of course, bigamy), or against human life. Men who marry between the ages of 18 and 25 offend against property more often than the unmarried of the same age, probably because of pressure of family expenses. Widowers commit more crimes between the ages of 30 and 50 than either the unmarried or the married; but their criminality decreases with their advancing years. He finds that widowers are especially prone to commit murder, incest, false accusation and false witness, and offences against property. His statistics show that the longer a man is married the nearer he approaches to being a law-abiding citizen. This, it has been suggested, may be due to the fact that the burdens of married life weigh heavier in the early years than later. See ALCOHOL; MARRIAGE, MEDICAL CONTROL OF.

CROATIA and SLAVONIA form a province of the kingdom of Hungary, and have a combined area of 16,773 square miles, and a combined population, in 1890, of 2,200,977, of whom 88 per cent. were Slavonians and Croats, and the remainder chiefly Hungarians and Germans. The capital is Agram, which is the seat of a university with an attendance of 568 students in 1896. On lands belonging to the university an academy of forestry with a botanical garden was opened in October, 1898. The chief products of Croatia and Slavonia are wheat, rye, barley, and oats, of which wheat is the most extensively raised, the crop in 1898 being many times as large as any of the others, and nearly twice as large as the wheat crop of the preceding year. The production of wine, fruits, nuts, tobacco, and raw silk is also important. The minerals include salt, iron and coal. The leading occupations are those connected with the soil, and agriculture engages more than 85 per cent. of the total population. But the manufacturing industries are considerable, and have increased in recent years. Matters which are the common concern of Croatia, Slavonia, and Hungary are under the legislative control of the Hungarian Diet, to which forty Croatian and Slavonian delegates are sent. They use their own language in that body, although the official language is the Hungarian. In the Hungarian executive departments there is a special minister for Croatia and Slavonia. The provincial Diet consists of 90 members chosen by the people and of certain dignitaries (not to exceed one-third of the Diet) holding their seats by inheritance or royal nomination. There is a low property qualification or the payment of a small tax required of all electors who do not practice certain professions.

CROKER, RICHARD, politician, born at Black Rock, Ireland, November 24, 1843, was brought to the United States at the age of two, and was educated in the public schools of New York. He was an alderman in New York in 1868-70, and again in 1888; coroner in 1873-76; fire commissioner in 1883; and city chamberlain in 1889-90. Mr. Croker became prominent in opposing the "Tweed ring," and has long been regarded as the leader of Tammany Hall. He attracted attention in 1899 by his "Jefferson dinner" at the Democratic Club in New York. In this year also, while a witness before the Mazet Committee, appointed to investigate alleged scandals in the municipal administration of New York, Mr. Croker caused consternation by frankly admitting that he was "boss" of the Tammany Democracy, and this organization acted upon the principle of the spoils system.

CROQUET-ROQUE. The eighteenth annual tournament of the National Croquet Association was held at the grounds of the Norwich (Conn.) Croquet Club, August 15-19, 1899. The championship was won by C. G. Williams, of Washington, with 12 out of 14 games. W. H. Wahly, of Washington, last year's champion, was second with 11 won games. The second division was won by P. N. Peck, Washington, 13 out of 14 games. Croquet has been superseded in popular favor by more vigorous pastimes, but it is still played as a game of skill. Owing to the scientific development of the game by the national association, as distinguished from the old-time croquet, the name has been changed, and the organization will be known hereafter as the National Roque Association.

CROSBY, PEIRCE, rear admiral, U. S. N., retired, died in Washington, D. C., June 15, 1899. He was born near Chester, Penn., January 16, 1824; was educated at a private school, and was appointed midshipman from Pennsylvania in 1838. He served with distinction in the Mexican and Civil wars, taking part in numerous engagements. He was promoted through all the grades to that of rear admiral. In 1882 he was in command of the Atlantic station, and of the Asiatic station in 1883, in which year he was retired.

CROUP. See VITAL STATISTICS.

CROZIER, WILLIAM, captain, U. S. A., was appointed by President McKinley a member of the American delegation to the peace conference which met at The

Hague in May, 1899. The appointment of the delegation was announced by Secretary of State Hay on April 6, 1899. Captain Crozier is the son of the late Judge Robert Crozier, of Kansas, and was born in Ohio in 1855. He was graduated from the Military Academy at West Point in June, 1876, and was assigned to the Fourth Artillery. For three years he served in the West under General Crook, taking part in the campaigns against the Sioux and Bannocks. From 1879 to 1884 he was instructor in mathematics at West Point, and in the latter year, after competitive examination, was transferred to the ordnance department, with which he has since been connected. He entered the department as a first lieutenant, and in June, 1890, received his commission as captain. After Congress in 1888 had made an appropriation for the establishment of a gun factory at Watervliet, Crozier was entrusted with the important task of investigating the improved machinery of European coast defence, and was empowered to make such purchases as he might deem wise. During the Spanish-American war he was major and inspector-general of volunteers, serving in this capacity from May 17 to November 30, 1898, when at his own request he received his discharge in order to resume his professional duties in the ordnance department. Captain Crozier is regarded as one of the most expert authorities on ordnance in the United States army, and several of his works on the subject are used in the department.

Together with General Buffington, the present chief of ordnance, he invented the Buffington-Crozier disappearing gun-carriage, now in general use in American coast-defence works. The patent rights of this invention were made over to the government by the inventors. Captain Crozier has also invented the wire-wrapped ten-inch rifle.

CUBA, the largest island of the West Indies, has an area of 45,872 square miles, a little more than that of the State of Pennsylvania, and a population estimated in 1887 at 1,631,687, of whom 528,998 were negroes and mulattoes. An estimate places the population on January 1, 1895, at 2,018,000, and on January 1, 1899, at 1,318,000, but these figures are merely conjectural. Doubt has been thrown upon the accuracy of the figures for 1887, which were the result of the Spanish census, and in August, 1899, President McKinley ordered a new census to be taken. It was not to deal with population alone, but to include statistics of the agricultural and industrial condition of the island. Such a census was politically necessary, since if representative government were soon established there, it would be necessary to ascertain the population in order to obtain the numerical basis of representation. At the close of the year 1899 the preliminary estimate of the population was 1,572,840. The capital of Cuba is Havana, with a population of about 220,000. The long coast line of Cuba is indented with a number of safe harbors. The length of the northern coast line is 918 miles, and it has 32 harbors; the length of the southern is 972 miles, with 12 important harbors.

Political Divisions.—The six provinces of Cuba were divided into three regions by the Spaniards, and these divisions have been retained under the provisional rule of the United States. The Western, including the provinces of Havana and Pinar del Rio; the Central, comprising Matanzas and Santa Clara, and the Eastern, comprising Santiago and Puerto Principe. The island, since the occupation by the United States, has been under a military governor, and each of these administrative divisions has been under a separate military governor, having exclusive charge of the local administration. Exact statistics for the production and commerce of Cuba during the year 1899 were not available, but the reports of the military governors throw light upon the general conditions of the country.

Social and Economic Conditions.—Both from official sources and from the reports of private observers the condition of Cuba appears to have vastly improved since the war with Spain. At the time when Spanish authority was withdrawn a very large part of the population were on the verge of starvation, and the political condition was one of anarchy. Reconcentrados, beggars, and criminals were the most conspicuous element in the island. As to the work which depended upon public support, it had been almost wholly abandoned. Roads were out of repair, the mail service was inoperative, public instruction had come to a standstill, and the local government possessed no authority. The mustering out of the Cuban army in May, 1899, removed a source of popular distrust, and there were signs of prompt recuperation. The industries were resumed, public order was restored, and American ideas on the subject of sanitation and hygiene produced important results. The only serious outbreak of yellow fever was at Santiago. At Havana there were very few cases as compared with past years. The tobacco and sugar-cane districts were rapidly recovering their prosperity. In some parts of the island, however, the agricultural progress was very slow, owing to the lack of the necessary capital. The financial condition of many of the municipalities, especially of those in the western provinces, was practically one of bankruptcy, and the city governments could not

meet their obligations without the assistance of the state. The general aspect of material conditions in Cuba can be best discussed under the head of the three administrative divisions, for which their military governors each rendered a report in 1899.

Central Cuba.—The total area of the department of Central Cuba, including the two provinces of Matanzas and Santa Clara, is 12,173 square miles, and the total population was estimated in 1899 at approximately 500,560. The effect of the war can be seen by a comparison of this figure with the estimate of 1894, which was 616,082, and to illustrate the enormous waste of property, the military governor notes that while the total number of horned cattle in the department in 1894 was 1,264,978, in September, 1899, it was only 83,696. Outside the large sugar plantations, production had virtually ceased, and the entire population was driven into the towns and villages to starve. The effective aid rendered by the United States through the distribution of rations among the farmers relieved the most acute cases of distress, and many farmers returned to the land. Though meat continued to be scarce, other kinds of food were soon raised in sufficient quantities to render further distribution of rations unnecessary except among those who were incapacitated for work. The chief crop in both provinces is sugar, the exports of which are annually about 80 per cent. of the total sugar exports of the island. In the fiscal year ending June 30, 1899, they amounted to \$11,828,000. The tobacco crop is important, especially in Santa Clara, and the product in 1899 was valued at \$3,187,500. The smaller farms appeared generally to be owned by native Cubans. As to the fertility of the soil, the larger part of the land will produce sugar continuously and profitably for a period of twelve or fifteen years, but much of it for only from three to five years, without replanting. There is little virgin soil, for most of the arable land has been at some time under cultivation. Little skill has been shown in cultivation, and the implements employed are often of the most primitive kind. Cattle-raising ranks in importance next to the sugar and tobacco industries, cattle being supported at very little cost owing to the luxuriant growth of grass over wide areas of land, but, as the figures given above show, the industry was virtually destroyed by the war.

Western Cuba.—The same story of the effects of the war is told by General Fitzhugh Lee, the military governor of the department of Western Cuba. Business had ceased, the sugar estates were no longer productive, and wide tracts of formerly well-cultivated land were uninhabited. The whole administrative machinery was destroyed. "The railroads on the island were in bad order, having been used to the extent of their endurance conveying Spanish troops and Spanish supplies over them, while the great calzadas or turnpikes were filled with holes, for the war prevented repairs to either railroads or roads. Municipalities were all greatly in debt. None of the civil officers had been paid, and school-teachers had large amounts of back salary due. Judicial officers were discharging their duties as far as they could—for there was really no law in the island except the mandate of the captain-general—without pay, and many months of back pay were due to the professors in the colleges of the largest cities. The whole framework of the government had to be rebuilt, and its machinery carefully and gradually reconstructed. Important government problems had to be promptly solved, which involved social, economic, commercial, agricultural, public instruction, support of eleemosynary institutions of all kinds, means of communication, reorganization of municipalities, with the necessary town and city police, including a mounted force to patrol the adjoining rural districts within the limits, and subject to the authorities of the mayors and council of their respective municipalities; the appointment of new alcaldes and other officers to replace those left in authority by the Spanish government, and who would be more in accord with the inhabitants whose local affairs they directed."

Eastern Cuba.—At the close of the war the industries in Eastern Cuba had practically come to an end. The larger sugar estates were producing from one-third to one-tenth of their normal crop. Live stock had been destroyed, and the little food production that was going on was the work of men detailed from the Cuban army. In the towns the effect of the edict of reconcentration could be seen in a large number of half-starved women, children, and old men. The hospitals were overcrowded and were but ill-supplied with necessities, and in certain of the country towns a large part of the people were threatened with starvation. There was further in this department a sharp antagonism between the Cubans who had fought in the war and those who had sided with the Spaniards to the extent of favoring autonomy, and for a time it seemed as if this might lead to serious disturbances, but a more friendly attitude was ultimately adopted. The sanitary condition of the towns was the worst conceivable. The death-rate was extremely high, and was reported in the city of Santiago at over 200 a day. As in the other departments, the civil gov-

ernment was practically at an end, and the country was threatened with civil disorders. After the surrender the chief work of the United States officials was the distribution of rations and the supplying of hospitals and charities with the necessary means of relieving the distress. Food was sent to all the seaport towns and into the interior to such towns as could be reached with pack-trains, and large quantities of medicines and clothing were supplied. During this critical period the general conduct of the people was reported by the military governor, General Leonard Wood, as being exceptionally good in the circumstances. Gradually the civil government was established and the municipal officers appointed in the various cities, these officers being nominated by a committee of the prominent citizens. The work of education was resumed, some sixty schools being opened in the city of Santiago, and more than 200 in the entire province. Great improvements were reported in the course of the year 1899. The farmers and laboring class had returned to work, and new industries had arisen throughout the whole department. The mines were in operation, and new mining projects for developing the zinc, copper, asbestos, manganese, and iron resources of the provinces were undertaken. But perhaps the most efficient work done under the auspices of the United States officials in this department was that of sanitation. A system of public works was undertaken, and extended its operations from month to month. Santiago and Puerto Principe received a thorough sanitary overhauling, and there was considerable sanitary work done in the towns of the interior. The great majority of the people were quiet and orderly under the American military rule, but complaint was made of the way in which the judiciary of the department did its work. Charges of corruption were numerous, and the inactivity of prosecuting officers was shown by the large number of untried cases in the prisons. The method of taxation also was severely criticised on the ground of its inequality and the failure to levy taxes in any proportion to the extent of personal possessions or individual abilities. And in the matter of education, while the schools were restored, the system was declared almost worthless, and the military governor recommended the establishment of a school system modelled on that of some of our States. The old danger of starvation was averted, and no cases of extreme distress were reported toward the close of the year. The attitude toward the Americans was friendly, and there seemed to be no likelihood that disorders would occur in the future. A study of existing conditions convinced the military governor, General Wood, that municipal elections might safely be held after the census was taken. As to the existing municipal system, General Wood reported that it was "cumbersome and unwieldy," and that there were many superfluous officials. He therefore favored a sweeping reduction of their number both in the small towns and in the cities. He also declared that years of misrule had been most damaging to the *morale* and efficiency of native officials, and that judging from the experience of the past year the military control must continue for some time.

Commerce.—The foreign trade of Cuba was greatly reduced by the war, and the only way to form an idea of the normal dimensions of Cuban commerce is to go back to the year 1892, which may be considered fairly typical. In this year the Cuban exports were \$83,018,228, and her imports were \$52,101,682. The exports from the United States to Cuba in 1894 amounted to \$20,125,321, and for the fiscal year ending June 30, 1899, to \$18,616,377. Agricultural products were the main item, and they comprised chiefly live animals, breadstuffs, provisions including dairy products, beef, and hog products. Among the more important manufactured products exported from the United States to Cuba were cotton cloths, machinery, boots and shoes, saws and tools, etc., but the manufactures did not constitute a large percentage of the total exports from the United States. It is also true of Spain's exports to Cuba that the most important item was agricultural products. Comparatively little information was available to show the foreign commerce of Cuba with other countries than the United States in 1899, but as to Cuba's foreign trade in general, the following description, quoted from the British Consular Reports for September, 1899, may be of interest: "The principal imports into Cuba are flour, rice, potatoes, dried codfish, groceries, wines and liquors, machinery, woollen and cotton goods, crockery, hardware, glassware, cattle, maize, lard, beer, and 'tasajo' (dried beef). Flour is imported from Spain and the United States. The bulk of the rice, which forms the principal article of diet of the creoles in Cuba, who consume on an average one pound per head per day, comes from India, via Liverpool; a small amount from Spain and the United States. Potatoes are imported from the United States, Spain, and the Canary Islands; codfish from the United States and Canada, and a small amount from Europe; groceries chiefly from the United States; wines and liquors almost entirely from Spain. The greater part of the sugar machinery comes from the United Kingdom; agricultural implements from the United States. Almost all tools are of American manufacture."

The following table shows the imports to Cuba and the domestic exports from the island for the fiscal years 1890 to 1899 inclusive:

	Domestic Exports.	Imports.		
		Free.	Dutiable.	Total.
1890	\$12,669,509	\$2,761,711	\$51,039,880	\$53,801,591
1891	11,929,605	28,044,502	35,669,893	61,714,395
1892	17,622,411	66,140,535	11,790,896	77,561,671
1893	23,604,094	66,049,369	12,657,137	78,708,506
1894	19,855,237	67,418,289	8,259,972	75,578,261
1895	12,533,260	17,384,765	35,186,494	52,571,259
1896	7,312,348	2,074,763	37,942,967	40,017,780
1897	7,599,757	1,270,059	17,186,756	18,406,815
1898	9,253,894	276,000	14,356,477	15,326,477
1899	17,247,952	1,031,718	24,377,115	25,408,828

Financial Conditions.—The financial conditions greatly improved under the American occupation, and from January 1 to June 30, 1899, the receipts of the Cuban government exceeded the expenditures by nearly \$1,500,000, while the budget under the Spanish administration usually showed a deficit. Under the Spanish rule, however, it must be remembered that Cuba had to pay heavy charges on the interest of the debt as well as for the support of the Spanish army. Among the measures for lessening the burden upon the people was a decree of March 25, which abolished the *octrois*, the taxes on food, and other taxes, and which reduced the land tax. It was further provided that the sale of land for debts contracted before January 1, 1899, should be suspended until the spring of 1901. A new customs tariff, with lower rates than those of the provisional tariff established in the summer of 1898, went into force on January 1, 1899.

Sugar and Tobacco.—Cuba's sugar crop amounts in normal years to nearly one-half the entire cane-sugar product of the world, and about 2,000,000 acres of the island are devoted to the raising of sugar. The highest mark in the sugar production of Cuba was reached in 1894, when the output was 1,054,214 tons. The effect of the war upon this industry can be seen from the following figures, showing the production from 1894 to 1898 inclusive, the figure for the last-named year being merely an estimate: 1894, 1,054,214 tons; 1895, 1,004,264 tons; 1896, 225,221 tons; 1897, 212,051 tons; 1898, 300,000 tons. The United States takes by far the greatest part of the Cuban sugar crop. Tobacco raising stands next to sugar in its importance as an industry. The best quality of tobacco has for years been produced in Cuba. A comparatively small acreage is devoted to the crop, the most of which comes from the western portion of the island—namely, the provinces of Pinar del Rio, Havana, and Santa Clara. In favorable years the production of tobacco has reached a total of 560,000 bales (62,173,800 pounds), and nearly one-half (260,000 bales) comes from the province of Pinar del Rio, and is known as *Vuelta Abajo*; 130,000 bales from Santa Clara, and is called *Remedios*; 100,000 bales from the eastern provinces, and is called *Mayar y Gibara*, and 70,000 bales from Havana, and is called *Partido*. As in the case of sugar, the great purchaser of tobacco is the United States.

Mining.—The mines of Cuba are almost exclusively in the eastern part of the island, and they are chiefly concentrated in the province of Santiago, where they are principally under the control of American companies. Cuba began to ship iron ore to the United States in 1884, when the imports to the United States from Cuba amounted to 21,798 tons. In 1897 the Cuban iron ore imported into the United States amounted to 397,173 tons, which was three-fourths of the total imports of iron ore. The ore is brown hematite, and contains about 62 per cent. of iron. It is said to be especially well adapted for the making of Bessemer steel. The first claim was located in 1881, and since that date it is said that about one hundred claims have been located in the Sierra Maestre range near the city of Santiago. The mines are not worked underground, but are virtually quarries, the ore outcropping on the hillsides.

Primary Education.—In 1894 the population of the four provinces of Havana, Matanzas, Puerto Principe, and Santa Clara, was 1,175,000; the number of schools, 1255, and the attendance, 47,752; there were in 1893, in the province of Havana, 107 public and 140 private—total, 247 schools for boys; 91 public, 190 private—total, 281 schools for girls; and 11 public, 16 private—total, 27 schools for both sexes; in all, 209 public, 346 private—total, 555 schools of primary grade. The attendance was 9455 in the public schools and 12,957 in the private schools—total, 22,412. In the province of Matanzas there were, in 1894, a population of 265,025, with 75 public boys' schools, 25 private boys' schools—total, 100; 53 public girls' schools, 34 private girls' schools—total, 87; and 58 schools for both sexes, making 128 public, 87 private—total, 273 schools. In the province of Puerto Principe the population in 1894 was 69,061; public elementary schools for boys, 20; girls, 17; both sexes, 4—

total, 41; private elementary schools, 35. The attendance at the public schools in 1894 was: boys, 986; girls, 801—total, 1,787; at the private schools, boys, 281; girls, 507—total, 788. The total attendance at both public and private schools was 2575.

In the province of Santa Clara there were in 1894 a population of 383,790 and 355 schools with an attendance of 12,697. In the province of Pinar del Rio the population in 1889-90 (latest available) was 229,761; schools, 160, and attendance, 4297. In the province of Santiago de Cuba there were a population of 271,010 and 186 schools with 7868 pupils.

Education in Cuba has always been of exclusive and aristocratic tendencies, the elementary instruction being given grudgingly, but the higher education comparing well with the best European or American education. In Havana, which is the seat of the university, there are several learned societies. The publications of 33 of these are received by the National Library at Washington, and there is a remarkable number of medical journals. "For a population of 200,000 souls, including many blacks, the number of scientific, educational, and literary periodicals in Havana is remarkable, and they contain valuable original articles. To sum up, therefore, the educational condition in Cuba, the evidence shows that the higher education is of a superior character; the study of the humanities has borne its usual fruit in literary taste and culture, and Cuba has given birth to poets who have attracted attention and won the praise of European critics. In recent years the sciences, with such technical applications as are adapted to the needs of a community which is not a manufacturing one, have been cultivated, and the enlightened part of the public has been kept informed of European philosophy and progress—all this with scant aid from, and sometimes despite the opposition of, the government. Elementary public instruction, on the other hand, has been and is in a very backward state, partly on account of the social condition of the island, but principally on account of the apathy and often the actual hostility of the government toward any serious attempts at improvement."

STATISTICS OF HIGHER EDUCATION.

Province.	Institution.	Date.	Students.
Havana	University	1891-92	1,853
Havana	School of Painting and Sculpture	1891-92	400
Matanzas	Colleges	1893-94	422
Santa Clara	Colleges	1893-94	359
Puerto Principe	Colleges	1891-92	199
Pinar del Rio	Institutes	1899-90	145
Santiago de Cuba	Institutes	1899-90	255

HISTORY.

The Spanish Evacuation.—On January 1, 1899, the control of Cuba was formally transferred to the United States. At that time the number of the Spanish troops in the island was estimated at 40,000, and this force was placed on the footing of extraterritoriality—that is, it was regarded as a foreign army in a friendly country. On February 6, the last remnant of the Spanish forces and the last of the Spanish captains-general of Cuba embarked for Spain.

Disbandment of the Cuban Army.—For more than eight months of the year 1899 questions connected with the disbandment of the insurgent forces occupied a large part of the public attention. Toward the close of the year 1898 the United States government had agreed as a condition of disbandment that \$3,000,000 should be distributed among the officers and troops of the Cuban army. The negotiations over this matter were interrupted by the death of General Garcia on December 11, 1898, and when they were reopened the Cuban assembly declared that this sum was far too small. Through their representative, General Maximo Gomez, they presented a demand for about \$57,000,000, which was to be regarded as a loan and was to be made good out of the customs receipts of Cuba. To the government at Washington such an amount seemed excessive. On the basis of 40,000 as the strength of the Cuban army this would have meant the payment of \$648 to each private and would have reckoned the salaries of the major-generals at \$7500 apiece, and that of the commander-in-chief at \$11,000. Negotiations were opened with General Gomez through the agency of Mr. Robert P. Porter for the purpose of securing the agreement of the Cubans to the amount originally offered. It was shown that the payment of so large a sum as that demanded by the Cuban assembly would mean a long-continued occupation of the island by the United States authorities in order to repay the loan out of the customs receipts. General Gomez finally accepted the terms proposed by the United States—namely, that \$3,000,000 should be distributed among the insurgent officers and troops, that the disbanding army should surrender its arms, and

that the Cuban officers should co-operate with the United States authorities in the distribution of the money. It was expressly stated that the sum paid to each member of the insurgent army was not to be regarded as an instalment of their military pay, but merely as facilitating disbandment and providing the discharged soldiers with means of subsistence until they found employment. The assembly, however, repudiated this agreement, and, declaring Gomez a traitor, deposed him from his command. On April 4, 1899, the assembly, having failed to make better terms with the United States, voted the disbandment of the army and its own dissolution, at the same time deciding to give to General Brooke the army muster-rolls as a guide for the distribution of the \$3,000,000 among the Cuban troops. General Gomez, whom popular sympathy favored in his quarrel with the assembly, was re-elected commander-in-chief by the Cuban generals, and made their representative in co-operating with the United States officials in the distribution. There were several serious difficulties in carrying out the disbandment. In the first place the Cuban troops were unwilling to surrender their arms to the American military authorities. This difficulty was overcome by changing the order so that they were permitted to surrender to the mayors of the municipalities in the presence of American officers. It was also provided that these arms should be distributed among the arsenals, where they should be kept on exhibition as souvenirs of the war of independence. A more serious difficulty was the confusion in the muster-rolls. It was found that the rolls contained the names of 6000 commissioned officers and 42,000 non-commissioned officers and privates. The rolls were grossly inaccurate, and the only way out of the difficulty seemed to be by requiring the identification of the persons named on the list by the officers under whom they had served. Such a course would have caused too serious delay, and it was finally decided to leave the distribution in the hands of two commissioners for each corps, consisting of one Cuban and one American, who were to distribute the money at certain designated places in the provinces. Disbandment began on May 27. The work was retarded not only by the confusion of the rolls, but by the agitation of the party that was opposed to the terms agreed upon. A very small number of men enrolled made their appearance when the distribution began, but later the distribution went on more rapidly. In some places the men were dissatisfied with the amount which they received, and at Cuevitas, near Santiago, a riot broke out on account of the slowness with which payments were made, but in September it was reported by General Brooke that the distribution had been completed. Two million six hundred thousand dollars had been spent, and some 30,000 Cubans had received their respective shares. The balance of \$400,000 was returned to the United States treasury.

Military Government.—General Brooke was appointed governor-general of Cuba and was assisted in the administration by other United States army officers as governors of the departments. A civil governor was appointed to act in concert with the military. General Brooke selected the following officers for the cabinet, whose general duties were to be the same as had been exercised by the autonomist cabinet under Spanish rule: Señor Capote (state and interior), Lanuza (agriculture), Desvernine (justice and education), and Yanez (public works). The municipal government was entrusted to native officials with wider powers than they had formerly possessed. A municipal police was organized and rural constabularies were established in the provinces. The Cuban army was drawn on very largely for the police and constabulary forces, but some of the natives complained that the men chosen for these positions were not representative. The exercise of a high degree of tact was required of the United States authorities to avoid giving unnecessary offence to the natives. Through bad management the funeral of General Garcia was the occasion of much ill-feeling among the Cubans, owing to the fact that the United States military crowded out the Cuban patriots from the functions which they were to have performed in the ceremony, and the funeral took on the character more of a military parade than of an occasion in which the Cubans and the United States troops united to do honor to the Cuban general. The sharp criticism which this occasioned soon subsided, and the reception of General Gomez at Havana created a favorable impression at the same time that it gratified the Cubans' natural fondness for display. The American troops turned out in honor of Gomez, who was met at Havana by the official representative of the governor-general. On the whole, considering the confused state of affairs following the war, a fair degree of order was maintained. Brigandage was suppressed either by the rural police or by United States troops. The misconduct with which United States troops were charged toward the close of the year 1898 and the difficulties between them and the natives, as illustrated by the conflict between the negro volunteers near Santiago and the native police, came to an end with the withdrawal of the volunteers and the substitution of the United States regulars. A number of important changes were effected under the military régime of the Americans. A pardon was issued for offences committed against Spanish military law. Some restriction of the native press



BRIGADIER-GENERAL LEONARD WOOD, MILITARY GOVERNOR OF CUBA.

From a copyrighted photograph by Miss Frances B. Johnston, Washington.

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was found necessary, and a decree was issued laying the responsibility for the publication of libels and other seditious writings in the papers on the editors and proprietors. Another important change was the abolition of the Spanish *incomunicado* system, by which the accused person was left in ignorance of the charges against him. It was provided that henceforth the accused person should know the charges against him and the name of his accuser, and that he should also have the right to engage counsel in twenty-four hours following arrest, and should not be forced to bear witness against himself. Press censorship was established at Santiago in June, and General Ludlow, the military governor of the city of Havana, suppressed a newspaper at Havana in August. Another decree permitted foreigners to practise professions which required special training, provided they could show diplomas from competent authorities in their own country. The work on the reconstruction of the judiciary was completed in August with the appointment of judges for the Supreme Court and judicial officers in the provinces. On the whole the benefits which were claimed as the result of American occupation were the restoration of order, the relief of poverty, the suppression of many administrative abuses, and the adoption of excellent sanitary measures, of which the most important practical results were the checking of yellow fever and the reduction of the death rate. Besides this the taxes were reduced and a number of important public works were undertaken.

Spaniards in Cuba.—Those Spaniards remaining in Cuba who desired to retain Spanish citizenship were required to register their names. There were evidences of sharp antagonism between the Cubans and Spaniards, and on some occasions this took the form of violence. A former lieutenant of a Spanish guerrilla force was lynched by a mob of Cubans on June 5, 1899, at San Antonio, and there were other instances of rough treatment of the Spaniards at the hands of the mob.

Relief Measures.—Some account of the distribution of rations for the purpose of averting acute cases of distress has been given in a preceding paragraph. Besides distributing these rations, efforts were made to employ the needy in public works. The sufferers from the war, especially the reconcentrado class, were, in many cases, prevented from the resumption of work by their lack of farm implements, but no regularly organized system was followed to meet this difficulty.

Policy of the United States toward Cuba.—An apparent object of the policy of the United States toward Cuba has been to prepare the Cubans for the exercise of self-government—a difficult task in view of the fact that the population has for centuries been in a condition of political slavery. The administration has advanced cautiously, and, while it has been its intention to withdraw the American troops as soon as possible, its plan is to maintain garrisons in certain parts of the island until it is evident that the people can be safely entrusted with the management of their own affairs. The general policy of the United States was indicated in the proclamation of President McKinley, dated August 17, in which he said that the census recently ordered in Cuba was the first step toward the accomplishment of the duty incumbent upon the United States to restore order and peaceful industry, and to give its attention to the means by which the Cubans might form an effective self-government. It was said that as soon as the census should be finished, local elections would be held in the island with a view to establishing a civil government. Apart from the original subjects of the statistical inquiry, the census was to investigate the sentiments of the people in regard to the establishment of a Cuban republic. In general, the policy of the United States was viewed with favor in Cuba, except by those radicals who still were insisting upon the absolute independence of the island. There is a strong party that would even prefer annexation to the United States, or the establishment of an American protectorate, to the total withdrawal of American authority.

CUBAN FEVER. See TROPICAL FEVER.

CULBERSON, CHARLES A., ex-governor of Texas, was elected as a Democrat, by acclamation, by the Texas legislature to the United States Senate, to succeed Senator Roger Q. Mills, January 24, 1899. Senator Culberson was born in Alabama in 1855; he was graduated at the Virginia Military Institute in 1874, after which he studied law and was admitted to the bar. He was governor of Texas from 1894 to 1898. His term in the Senate will expire March 3, 1905.

CUMBERLAND PRESBYTERIAN CHURCH reports much activity for 1899 in the organization of committees for, and the inception of work upon, the collection of \$1,000,000 which it is proposed to raise for educational purposes and the enrolling of 50,000 new Sunday-school pupils, which it is hoped will be accomplished by July 1, 1901. The new synod, called the Indianola Synod, formed of the Cherokee, Chickasaw, Choctaw, and Greer presbyteries, embraces Oklahoma and Indian Territories, numbers some 45 ministers, 25 probationers, 76 churches, 1714 communicants, and 820 Sunday-school scholars, and has property valued at \$19,000, and an

annual income of about \$6000. Four new missionaries were sent to China and Japan. This branch of the Presbyterian Church in 1899 had 16 synods, 123 presbyteries, 1720 ministers, 2982 churches, and 186,582 church-members.

CUMBERLAND PRESBYTERIAN CHURCH (COLORED) reports 5 synods for 1899, with 23 presbyteries, 150 ministers, 400 churches, and 39,000 communicants.

CURAÇAO, a Dutch colony lying north of the Venezuelan coast, and comprising the islands of Curaçao, Aruba, Bonaire, Saba, St. Eustache, and part of St. Martin, has a total area of 403 square miles, a population (at the beginning of 1897) of 49,599, of which the island of Curaçao has 210 square miles and 28,884 inhabitants. The government is directed by a governor, assisted by a council, all being nominated by the sovereign of the Netherlands. At the beginning of 1897 there were 41,235 Roman Catholics, 7730 Protestants, and 831 Jews; 28 schools, with upward of 5538 pupils. The revenue, which is derived from customs and excise duties, land taxes, and some indirect taxes, was estimated for 1898 at 638,000 guilders, and the expenditure 700,000 guilders. (The guilder is worth \$0.402 United States currency.) Deficits are paid by Holland. The imports of the island of Curaçao amounted in 1896 to 2,962,668 guilders; in 1897, 2,679,924 guilders. The chief products are maize, beans, pulse, cattle, salt, lime. The shipping entered at the ports of the colony in 1896 aggregated 526,148 tons.

CURLING. One of the most fascinating of winter sports is the venerable game of ice-curling, like golf of Scotch origin, and largely supported in America by natives of Scotland. The annual curling competitions, though not widely advertised, are contested with much spirit and are full of interest to the spectator. The annual champion club match for the Mitchell medal was held January 20, 1899, at Hoboken, N. J. The play was on six rinks, and was won by the Van Cortlandt Club, I. Frazier being skip. The games of the North v. the South of Scotland for the Dalrymple medal, held at New York for many years, were abandoned during 1897-98, but were revived in 1899, and were won on December 28 by the South, the score being 87 to 59 and the play on five rinks. The Ontario tankard is a trophy competed for annually by clubs belonging to the Ontario Curling Association, divided into sixteen groups; deciding contests take place at Toronto, 128 curlers participating. The trophy was won in 1899 by the Fergus team. The Gordon medal, in the international match played at Montreal, two rinks, on February 24, was won by Canada. The Canadians defeated the Americans also in the match for the Walker trophy, at St. Paul, Minn. The annual Hoboken, N. J., match of the Scots against all nations was won by the former on January 19, by 30 to 26.

CURRENCY REFORM. In 1899 the prospects of currency reform seemed to be more promising. In the President's second annual message to Congress at the close of 1898, he said: "In my judgment the present condition of the Treasury amply justifies the immediate enactment of the legislation recommended one year ago, under which a portion of the gold holdings should be placed in a trust fund, from which greenbacks should be redeemed upon presentation, but when once redeemed should not thereafter be paid for gold." This plan, which would relieve the government of the much-lamented "endless chain," seemed to meet with general approval among the friends of sound money. The separation of the gold reserve from the general fund of the Treasury was regarded as a matter of the greatest importance by all those who had not forgotten the lesson of 1893, when the impairment of the gold reserve caused so much anxiety. The creation of this trust fund would oblige the secretary of the treasury to look to other means than the gold reserve for making good the deficiency of revenues. Congress would have to meet the emergency by revenue legislation. There would be no more borrowing for the purpose of securing gold to protect the government's currency—a practice which experience shows to be injurious to the public credit. The Fifty-fifth Congress closed without passing any currency measure. The McCleary bill, described in the preceding YEAR BOOK, was withdrawn by the House Committee on Banking and Currency. Two other measures were afterward drafted, the one proposed by E. J. Hill, a Republican representative from Connecticut, and the other by M. Brosius, a Republican representative from Pennsylvania. The Hill bill was prepared by the House Committee on Coinage, Weights, and Measures. Its leading features were, first, an emphatic declaration of the gold standard; second, provision for the gradual retirement of greenbacks; third, permission for the banks to issue circulation to the par value of the bonds deposited; fourth, the substitution of a tax of one-tenth of one per cent. upon the value of the bank's franchise for the present tax circulation; fifth, permission for national banks to organize with a capital of only \$25,000 in small towns. The Brosius bill was not so detailed as this measure, but contained the three provisions relating to the tax, the issue of notes to the par value of the bonds, and the organization of banks with a capital of \$25,000. Neither of these bills was

passed, and on February 2 the Republican caucus of the House of Representatives formally abandoned any attempt to pass currency acts during the Fifty-fifth Congress, giving over the subject to a committee of eleven which was to report at the first session of the Fifty-sixth Congress. This committee, consisting of Representatives Henderson, Payne, Dalzell, Overstreet, Curtis, Lovering, Loud, Hawley, Babcock, Morris, and Kerr, held its session at Atlantic City, N. J., from April 17 to May 1, 1899, and finally agreed upon a bill, the text of which was published on November 28. It is entitled "A bill to define and fix the standard of value, to maintain the parity of all forms of money issued or coined by the United States, and for other purposes." It begins with an express affirmation that the standard unit of value shall be the gold dollar of 25.8 grains of gold and .9 fine. It then states that all interest-bearing obligations now existing or hereafter to be entered into, and all United States notes and treasury notes issued under the law of July 14, 1890, shall be payable in gold coin. But nothing in this provision is to be construed as affecting the present legal tender quality of the silver dollar, or of the subsidiary or minor coins, or of the paper currency of the United States, or of national bank-notes as receivable for certain public debts and dues and obligations between national banks. The bill next provides for a separate division of issue and redemption under the treasurer of the United States, to which is to be assigned the records and accounts relating to the issue and redemption and exchange of United States money, and to which shall be transferred "as a redemption fund the amount of gold coin and bullion held against outstanding gold certificates, the amount of United States notes held against outstanding currency certificates, the amount of silver dollars held against outstanding silver certificates, the amount of silver dollars and silver bullion held against outstanding treasury notes issued under the act of July 14, 1890, and the amount of gold coin and bullion which constitute a reserve fund equal to 25 per cent. of the amount both of United States notes and treasury notes issued under the act of July 14, 1890." The safeguarding of the silver dollar is provided for by the requirement that the secretary of the treasury shall maintain the gold reserve fund by transferring to it moneys not otherwise appropriated, and by issuing and selling United States bonds, whenever in his judgment it is necessary, at a rate not exceeding 3 per cent. In other words, the secretary of the treasury is to keep the two metals at a parity, and is supplied with the necessary means for that end. Many held that all the obligations of the government were payable in gold without this new clause, but it is important as a definite and positive statement of the fact. The bill provides for the coinage of any silver bullion in the Treasury purchased under the act of July 14, 1890, into subsidiary silver coin when it is necessary to meet the public requirements for such coin. As to the national bank circulation, the amendments in the existing law were important, but by no means so radical as many of the currency reformers desired. In the first place, the banks were permitted to issue notes to the par value of the bonds deposited; secondly, a tax of one-tenth of one per cent. upon the value of the bank's franchise was substituted for the existing tax on circulation, and thirdly, banks with a capital of \$25,000 may, with the sanction of the secretary of the treasury, be organized in any place whose population does not exceed 2000. The House passed this measure on December 18. In the Senate a bill very similar to this was drafted by the Finance Committee and reported on December 19. This bill contained a plan for refunding the debt. The secretary of the treasury was authorized to issue gold bonds bearing 2 per cent. interest for outstanding bonds maturing before 1908, and bearing 5, 4, or 3 per cent. interest. The two bills were under discussion when Congress adjourned.

The Comptroller's Proposals.—In his annual report for the year ending October 31, 1899, the comptroller of the currency renewed his recommendation of the previous year that provision should be made for unsecured emergency circulation in order to check the injurious effects of financial panics, this circulation to be taxed so heavily that in ordinary times it would not be issued. The notes would be available only in times of emergency, and the tax, besides causing them to be quickly retired when the panic had passed, would also provide a fund out of which the notes of insolvent banks might be redeemed. Such a provision would in his opinion secure elasticity for the currency, even if the principle of a bond-based currency were retained. The President's idea, embodied in the bill framed by the Republican Caucus Committee, that notes should be issued to the par value of the bonds deposited, was also favored by the comptroller, who, in addition, recommended a taxation of two or three per cent. on the additional 10 per cent. circulation thus allowed. At the same time he favored the reduction or abolishment of the existing tax of one per cent. on the circulation. The comptroller estimates the possible bond-secured emergency circulation at \$30,000,000, and even if the uncovered emergency circulation were not adopted, the changes recommended would be of great public service. He does not think that the issue of notes based on the assets of the bank would be justifiable under normal conditions, but only in times of panic, when it would be a remedy like the use of clearing-house certificates.

CYCLING. The most notable matter of discussion in the bicycling world during 1899 was the question regarding the control of racing. A number of the prominent wheelmen on the track became dissatisfied with the management of the sport as carried on by the officials of the League of American Wheelmen, and entered races under the newly formed National Cycling Association. In spite of the efforts of the former body, it became evident that the National Cycling Association would eventually supersede the league as a racing body. Such was apparently the preference of the great majority of the league's own members, although officially the league resented, and for a time resisted, the entrance of the cycling association into the racing field. Those who favored the retirement of the L. A. W. from the control of track affairs were of the opinion that that organization should devote its time solely to the aims for which it was founded—namely, an active and constant campaign for good roads, and furtherance in all possible ways of the personal and legal interests of wheelmen. It became certain toward the close of 1899 that the L. A. W. would at its annual meeting formally relinquish control of professional and amateur racing. As a result it is believed that the organization will become stronger than ever as a national association for the advancement of general wheeling interests. The membership is now about 10,000.

Several remarkable records were made during the year. Charles M. Murphy, of New York, rode a mile, on June 30, in 57½ seconds, being paced by a locomotive on the Long Island Railroad, making by far the greatest speed ever attained by a machine propelled by man. He rode upon a straightaway, board track, and was sheltered by a wind shield on the locomotive, with great suction power. He lost the pace at one time and dropped behind, but caught up again by a wonderful spurt. Other paced professional races of the year established the following time: One-half mile, 40½ seconds; one mile, 1.19; two miles, 2.54; three miles, 4.23; four miles, 5.51½; five miles, 7.12½. The one-mile record was made by "Major" Taylor, and the others by E. A. McDuffee, who is said to have used wind shields, with a flying start. The six-day race, held in New York in December, was run under new regulations, the riders being allowed to contest only in pairs and not as individuals. Each was allowed to ride not more than twelve out of every twenty-four hours, the total made by both being credited to them jointly. Miller, the winner of 1898, and his partner, Waller, covered 2733 miles, 4 laps, which is 726 miles more than the mileage made by Miller alone in 1898. A number of new amateur track records were made in 1899, the Pacific Northwest contributing to them for the first time. The year showed a remarkable decline in general riding and club membership, affecting even the League of American Wheelmen. Wheeling as a fad having now died out, a healthy growth is assured for the sport, while the bicycle itself is becoming more and more devoted to business uses, one example of which is the equipment of telegraph-boys in New York City with wheels.

CYPRUS, one of the largest of the Mediterranean islands, lying about 40 miles west of the Syrian coast, is a dependency of Great Britain, acquired from Turkey in 1878. It has an area of 3584 square miles, and a population of 221,343, of which 161,360 are Greek Christians and 47,926 Mohammedans. Cyprus belongs to the second class of representative colonies, in which the legislature is partly elective and partly controlled by the governor. The executive and administrative authority is vested in a British high commissioner, with an executive council, and in a legislative council of 18, of whom 12 are elective. Its capital is Nikosia, an inland town of 12,515 inhabitants. Larnaca, population 7593, and Limasol, population 7388, are ports. The foreign trade is good, the principal exports being grain, wine, silk, cotton, hides, wool, stock, fruits, and vegetables; imports: cotton and woollen goods, tobacco, groceries, rice, iron, leather, petroleum, timber, sugar, soap, and copper manufactures. The import and the export values are about equal. The revenue, derived chiefly from tithes, customs duties, excise, stamps, etc., has an annually increasing excess over the expenditures of the island. In 1899 the Imperial government, under the Colonial Loans Act of 1899, advanced £314,000 for harbor railways and irrigation works. The railway will run from the capital, Nikosia, to Famagosta, where a harbor will be made.

OZAREVITOH. See GEORGE ALEXANDROVITCH; MICHAEL ALEXANDROVITCH.

OZECHS. See AUSTRIA-HUNGARY and BOHEMIA.

DAHOMEY. The French West African dependency of Dahomey, on the Gulf of Guinea, between the British Gold Coast and the Niger Territories, has attracted attention within the past few years by reason of the conflicting claims of France, England, and Germany over a large stretch of country in West Africa, in which was included the hinterland of Dahomey. Dahomey comprises two political divisions, with a total area given in 1898 as about 14,000 square miles, but which was somewhat increased in 1899 by the Anglo-French treaty. Its population is about 600,000. Dahomey was acquired by the French in 1892 through the defeat and dethronement

of the native sovereign. It is divided into, first, a protectorate, the native kingdom under the rule of a local African prince, and, second, a colony proper, comprising the Benin settlements on the coast, and an area of back country. The colony has been united for administrative purposes with French Guinea (*q. v.*), but has been under the direction of a local governor. In 1899 part of French Soudan, which then ceased to be a separate colony, was assigned to the colony of Dahomey, and the colony was placed under the governor-general of French West Africa, at St. Louis. The capital is Abomey, north of the port of Whydah, which with Kotonu is the principal trading town. Grand Popo and Porto Novo are also trading centres. The Dahomé, or natives, carry on the principal agricultural operations. There are exported from Dahomey maize, cattle, ivory, India-rubber, and the finest palm oil. It is reported that the exports for palm oil reached a total for 1899 of nearly 10,000 tons, and about 20,000 tons of palm kernels are said to be exported annually. In regard to the territorial dispute affecting Dahomey, see NIGER TERRITORIES.

DAIRYING. The subject of dairying is one which has received considerable attention within the last few years, as is evidenced by the many radical changes which have taken place in the methods of work. This improvement is especially notable in the United States and in such European countries as Denmark, Holland, and Sweden, where there are many dairy schools and experiment stations for investigation. In Denmark, the leading dairy country of the world, there are about a dozen high-grade agricultural institutes, where courses in dairying are given, besides about one hundred high schools where this subject receives some attention, and about two thousand dairies which receive pupils for practical work. In the United States there are fifty institutions, including agricultural colleges and minor institutions, where courses in dairying are given. The number of creameries in operation in the United States in 1896 was estimated at ten thousand, and about one-fifth, or 300,000,000 pounds of the total butter output for that year was made in creameries.

There is no branch of agriculture in which co-operation has been so extensively practised as in dairying. This has been the means of instilling more business-like methods into the dairy farmers, as well as introducing a spirit of co-operation among farmers which has enabled them to combine their influence in working for better conditions. With the introduction of modern dairy methods much of the old-fashioned drudgery which befell the farmer's wife has disappeared. In many parts of the United States the farmer now brings his fresh milk to the creamery, which is weighed, and a sample is tested for the percentage of cream which it contains. The amount of cream which the milk contains is readily ascertained from this test. He receives credit for the cream, and the skim milk corresponding to the amount due him is taken back to his farm, while in some other instances an agent of the creamery takes the separated cream directly from the farmer's house to the creamery.

Dairy Breeds.—One of the results of practical experience and scientific investigation which has been pretty well established is the proper breed of cattle for dairy purposes. The Jersey and Guernsey are the best butter producers, as they will produce the largest amount of butter fat of the best quality and flavor for the least money. For milk producers, however, the Holstein-Frisian are the best, but their milk is so poor in solid material that it not infrequently falls below the legal standard. On the other hand, the Ayrshire milk is good for consumption, as it is not so rich in fat as the Jersey and Guernsey, or so watery as the Holstein-Frisian. The Ayrshire are especially adapted for general purposes, and are an excellent stock for cross-breeding on account of their rugged constitution. Native cattle are also used for breeding, but it is difficult to transmit their characteristics on account of their mixed nature and lack of prepotency. When bred with a thoroughbred bull, however, a better strain of cattle is produced. All of the characteristics are found in the mixed breeds.

Produce and Feeding.—The amount of butter which an average cow will produce per annum is about 130 pounds, the value of which is considered quite near the cost of keeping. The better breeds of cattle will produce from 300 to 350 pounds, and individuals go higher. In so far as the modification of characteristic products of the various breeds are concerned by feeding, it is generally considered that while the quantity of milk can be increased the quality cannot be modified except temporarily. The generally accepted rations for dairy cattle consists of the following ratio: Proteids, 1; carbohydrates, 5.4, although recent experiments seem to show that a slightly wider ratio is superior.

Dairy Apparatus.—The great changes which dairying is undergoing at the present time and the numerous improvements which are taking place are due largely to the introduction of various types of machinery for handling dairy produce. The original Babcock tester, which consists of a centrifugal method of separating cream in small graduated tubes, would read to about one-tenth per cent., whereas recent modifications and improvements of this tester is capable of giving results equal to one-hundredth per cent. The Babcock tester is universally used by dairy men in testing their cattle. The improvement in mechanical separation has been equally noteworthy.

There are at the present time some half a dozen or more separators on the market, some of which are American inventions and others of European origin. Those most generally in use are the De Lavel, United States, Sharples, and National. Recent experiments have shown that these separators are capable of taking out all but .01 per cent. of the butter fat in the milk. Much improvement is being made in the construction of new churns, and combined churns and butter makers are now on the market, which greatly facilitate the making of butter. Butter made in these appliances requires less manipulation, can be held at a constant temperature, and avoids mechanical losses. A recent European invention is the combined separator, churn, and butter worker. This machine separates the cream from the milk, Pasteurizes it, cools, and churns it.

Milk and Cream Preservation.—Numerous attempts have been made during recent years to preserve milk and cream, but outside of the method of condensation little progress has been made toward absolute sterilization without detriment to the product. Undoubtedly milk and cream can be absolutely sterilized without injuring in the least its flavor, and this, it may be stated, has been accomplished, although the method and apparatus has not as yet been perfected and put on the market. Should a practical method be discovered the dairy industry would be completely revolutionized. The chemical and excessive heating methods of preserving milk are unsatisfactory on account of their rendering the milk unwholesome. Pasteurization of milk and cream, which consists of subjecting it to a temperature of 140° to 155° Fahr., is largely practised for hygienic reasons, and it enables dairymen to handle their products to a much greater distance. Pasteurized cream is now in use to a considerable extent in the United States, which contains 40 to 50 per cent. of butter fat and retails for about 40 cents per quart. This gives a better profit to the farmer than butter. Many improvements are constantly being made in Pasteurization, and the same idea holds good here as in other new dairy apparatus—namely, to make the apparatus do continuous instead of intermittent work.

Quality of Butter.—The price paid for butter varies considerably in the United States. Ordinary butter at the present time sells from 25 to 35 cents per pound, according to the quality, and fancy butter brings as high as 50 cents or \$1 per pound. Pure cultures of bacteria for ripening butter and giving it a flavor and aroma have been in use for some years, and this method is now in vogue in Denmark and other European countries. In the United States, however, this practice has somewhat fallen off, as it has been found that good butter can be made without the aid of inoculation of specific germs. Nevertheless, the use of pure cultures in the United States has brought out the fact that care and cleanliness in the dairy is of the utmost importance in butter making. Among the ferments which have been tried in this country are Hansen's Lactic Ferment, which is used to give a certainty to butter ripening, Conn's No. 41 Bacillus, and the Boston Butter Culture.

Dairy Laws.—Most of the United States of America possess dairy laws for the purpose of protecting the farmer and consumer of dairy products. These laws vary much in the several States, and some of them are very bulky for the reason that old existing laws have not been repealed and replaced by new ones. Space, however, will not permit of their discussion here. It may be stated that these laws cover the milk standard, the constituents of butter and cheese, and special laws for controlling imitations. A full account of these laws, including those of Canada also, can be found in the fourteenth annual report of the Bureau of Animal Industry, Washington, D. C.

DALY, AUGUSTIN, playwright, dramatic critic, and theatrical manager, died in Paris, France, June 7, 1899. He was born at Plymouth, N. C., July 20, 1838. In December, 1859, he began to write for the *New York Sunday Courier*, and for nine years was active in dramatic journalism, acting as dramatic critic not only for the *Courier*, but for the *Evening Express*, the *Weekly Citizen*, the *Sun*, and for a while for the *Times*. His first successful play was *Leah, the Forsaken*, adapted from Mosenthal's *Deborah*, and produced in December, 1862, in Boston, and in the following month at the Winter Garden Theatre, New York, with Kate Bateman as "Leah." His next venture was to add to the task of play adapter that of manager, and soon after he was successful in his presentation of *Taming a Butterfly*, adapted from Sardou's *Le Papillon*, and *Griffith Gaunt*, which he adapted from Charles Reade's well-known novel. His first original drama was *Under the Gaslight*, a New York story, produced in 1866. Thereafter Daly's productions included plays of his own writing or adaptation and plays of contemporary and classic authors. Of the former class may be mentioned *Seven-Twenty-Eight*; *Pique*; *Divorce*; *The Great Unknown*; *Love on Crutches*; *The Railroad of Love*; *The Red Scarf*; *The Last Word*. In the summer of 1869 Daly assumed the management of the old Fifth Avenue Theatre, in West Twenty-fourth street, on the site afterward occupied by the Madison Square Theatre. He continued as manager of the Fifth Avenue until it was destroyed by fire on New Year's Day, 1873. In December of that year he

opened the new Fifth Avenue Theatre. He returned in 1879 from a long trip abroad, in which he had devoted himself to observation and study, and in September of that year he opened Daly's Theatre. This theatre became famous for his-
trionic talent, scenic effect, and excellence of the plays produced. Almost from the first Miss Ada Rehan has been the leading actress there; in fact, she was in the cast of the first play presented, *Love's Young Dream*, and appeared the first night. Among Daly's many productions in this theatre are the following: *An Arabian Night*; *The Passing Regiment*; *The Country Girl*; *The Wonder*; *The School for Scandal*; *The Recruiting Officer*; *The Inconstant*; *The Belle's Stratagem*; *The Squire*; *Lords and Commons*; *The Great Ruby* (his last production); *The Merry Wives of Windsor*; *A Midsummer-Night's Dream*; *Twelfth Night*; *The Taming of the Shrew*; *As You Like It*; *The Merchant of Venice*; *Two Gentlemen of Verona*; *Much Ado About Nothing*; *Love's Labor's Lost*; *The Tempest*.

Daly's Theatre was long recognized as a dramatic school of high practical value, and positions in his casts were eagerly sought by aspiring members of the profession. Daly's observation of details was remarkable and his discipline was severe, the result of which was to bring out the best qualities of his actors. During his career he was associated as manager with hundreds of well-known actors, among whom the following may be named: G. L. Fox, Mrs. Scott Siddons, E. L. Davenport, Fanny Davenport, George Clarke, James Lewis, Mrs. Gilbert, Clara Morris, Kate Claxton, Sara Jewett, W. J. Le Moynes, George Griffiths, Fanny Januschek, Mrs. John Wood, John Brougham, Charles Coghlan, John Drew, Maurice Barrymore, Edwin Booth, Carlotta Leclercq, E. A. Sothorn, Virginia Dreher, Isabel Irving, Maxine Elliott, Henry Dixey, Frank Worthing, Charles Richman, Ada Rehan. Daly's company made several English and European tours, and in 1893 Daly's Theatre, Leicester Square, London, was opened. But the simultaneous management of theatres on both sides of the Atlantic was not profitable.

DALY, CHARLES PATRICK, LL.D., ex-chief justice of the Court of Common Pleas in New York City, died at North Haven, Long Island, September 19, 1899. He was born in New York, October 31, 1816. After attending the public schools for a time he went to Savannah, Ga., where he obtained a clerkship. Becoming dissatisfied he went to sea, and during the next three years visited many prominent ports of the world. One of his voyages took him to Algiers, and he was present at the siege and capture of that city in 1830. Having returned to New York, Daly became a mechanic's apprentice and devoted his leisure hours to study. At the end of his apprenticeship he entered the law office of William Soule, and, though at that time seven years of study were required for admission to the bar, so diligent and successful had Daly been in his work that upon a motion before Chief Justice Nelson the seven-year rule was set aside and the young lawyer was admitted to practice after studying three years. This was in 1839. In 1843 he was elected as a Democrat to the legislature. In the following year Daly was appointed by Governor Bouck a justice of the Court of Common Pleas in New York City, and on this bench he remained for forty-two years. By an amendment to the State constitution the office became elective in 1846, and Daly was elected to the same position, and thereafter was re-elected three times; while from 1858 to the time of his retirement for age in 1885 he was chief justice of the court.

Daly was always known as a just and non-partisan judge. It was his uprightness that brought upon him the displeasure of the "Tweed ring," which attempted to defeat him for renomination in 1871 when his second term was about to expire. Then came, however, the exposure of the ring, and Daly was the nominee of both the Democratic and the Republican party; it is said that every vote cast in the city of New York for the judiciary that year was cast for him. During the Civil War he was a staunch supporter of President Lincoln's administration. He was a member of the State constitutional convention in 1867. Besides his legal fame, Daly gained a reputation for scientific and literary attainments; of him Baron von Humboldt wrote: "Few men have left upon me such an impression of high intelligence on subjects of universal interest." From 1864 to the time of his death he was president of the American Geographical Society, and his annual addresses to the society were valuable contributions to geographical literature. He was an honorary member of nearly all the foreign geographical societies, and a member of several scientific societies in this country. In 1860 he received from Columbia the degree of Doctor of Laws. When he died his library comprised 12,000 volumes. He wrote: *A History of Naturalization and of the Laws in Different Countries*; *The Judicial Tribunals of New York from 1623 to 1846*; *The First Settlement of the Jews in North America*; *The Origin and History of Institutions for the Promotion of Useful Arts by Industrial Exhibitions*; *What We Know of Maps and Map-Making Before Mercator*; *When Was the Drama Introduced in America?*; *History of Physical Geography*; *The Nature, Extent, and History of the Surrogate's Court in New York State*; *Comparisons Between Ancient and Modern Banking Systems*. Be-

sides these he published a number of volumes of law reports and many important legal papers.

DAMS. An immense masonry dam is now being built across the river Nile, at the Assouan cataracts, by the Egyptian government. It is all the more notable because it is located just below the small island on which is the Temple of Philæ. To lessen the danger of injuring the temple, so precious to Egyptologists and lovers of ancient art, the dam is not being carried to so great a height as utilitarian reasons would demand, but nevertheless it will be over 90 feet high. It is nearly 6400 feet, or over a mile, long, 23 feet wide at the top, and about 80 feet wide at the bottom. It is built of granite rubble masonry, and is founded on solid granite rock. The top will be about 10 feet above the level of high water in the reservoir, and will carry a roadway, thus serving as a bridge as well as a dam. The flood-waters will be discharged through sluiceways built in the body of the dam. There will be 180 of these, of which 140 will be about 6½ feet wide and 23 feet high, and 40, placed higher up, will have half as great an area as the lower ones. All of the upper and 20 of the lower sluices will be lined with cast-iron plates, about 1½ inch thick. During the flood season all the sluices will be open, discharging the whole flood-waters of the Nile, which on extraordinary occasions are estimated at 490,000 cubic feet per second. A canal a mile long, with locks giving a total fall of nearly 70 feet, in four drops, will provide for the passage of boats around the dam. The capacity of the reservoir formed by this dam will be about 280,000,000,000 gallons. The water will be collected between November and April, and will be used during May, June, and July, after having flowed down the river for 330 miles, to Assuit, where a diverting dam, or barrage, will turn the water into irrigation canals. This barrage is no mean structure, being over half a mile long, and having 120 openings, each over 16 feet wide, with piers nearly 7 feet wide between them. The structure will be of granite masonry, on a continuous foundation or floor of concrete some 10 feet thick, with a continuous row of cast-iron sheet piling on the upper and the lower side of the concrete. The estimated cost of the Assouan dam, lock, and accessories, including land, is \$6,125,000; of the Assuit barrage, \$2,245,000; which, with \$380,000 for the headworks of the Ibrahimia irrigation canal, make a total of \$8,750,000.

In this country a very high dam is being constructed to form a reservoir for the water-supply of Denver, Col. Its greatest height will be 210 feet, but the site is so ideal, being in a narrow, rocky gorge, that it is only 25 feet long at the base, not over 50 feet long for the first 50 feet in height, and only some 500 feet at the extreme top. The dam will have a water-tight inside face or lining, composed of steel plates, each 5x10 feet in area, ¾ inch thick, coated with asphalt to prevent rusting. These plates will be riveted to steel beams, extending into the rock below and at the sides of the dam. The steel plates, which are placed at an angle of 60° to the horizontal, are backed by 2 feet of concrete, and behind the concrete is 15 feet of carefully laid granite blocks. The bulk of the dam, still further back, is of granite boulders, thrown into place by the force of the blasts which dislodge them from the side of the gorge, or else deposited there from cars running on a temporary bridge. Water will be drawn from the reservoir through tunnels driven through the rock. One of these will be located 110 feet above the bottom of the dam, and the water drawn through it may be used to develop electrical power. The dam will form a reservoir having a width of from a few hundred feet to 1½ miles and a length of 7 miles. The water will be 200 feet deep at the dam, 150 feet deep three miles away, and 50 feet deep six miles up stream. The storage capacity of the reservoir will be 35,000,000,000 gallons. The dam is being built for the Denver Union Water Company by an auxiliary corporation known as the South Platte Canal and Reservoir Company. It is located on the South Platte River, about 48 miles to the south of Denver. Mr. Charles P. Allen is the chief engineer of the company.

Work on the great Croton dam for the water-supply of New York City has been continued throughout the year, and must proceed for a number of years more before it will be completed. Preliminary work is in progress for a large dam across the Nashua River at Clinton, Mass., for the water-supply of the Metropolitan Water District, which includes Boston and other municipalities in that vicinity.

DANFORD, LORENZO, member of Congress, was born in Belmont County, O., October 18, 1829; died near St. Clairsville, O., June 19, 1899. He was educated at the public schools and at Waynesburg, Penn.; was admitted to the bar in 1854, and from 1857 to 1861 was prosecuting attorney of Belmont County. He entered the Union service in April, 1861, and rose to the rank of captain, serving until August, 1864. In this year and in 1892 he was a Presidential elector. As a Republican, he represented in Congress the sixteenth district of Ohio from 1873 to 1879. He was elected again to the Fifty-fourth, Fifty-fifth, and Fifty-sixth Congresses; his term of office would have expired in 1901.

DANFORTH, ex-Judge GEORGE F., was born in Boston in 1819, and died September 25, 1899, in Rochester, where he had practised law for over fifty years. He graduated from Union College in 1840. In 1876 he was the Republican candidate for judge of the Court of Appeals, but was defeated by Robert Earl. Two years later he was renominated and elected, taking his seat January 1, 1879. He retired in 1891. He was a member of the Judiciary Commission in 1892. He continued the practice of his profession up to the time of his death.

DANISH WEST INDIES, three islands—St. Croix, St. Thomas, and St. John—lying to the east of Puerto Rico and belonging to Denmark, have been regarded by naval authorities and others since the Spanish-American war as points of such strategic value as to warrant their purchase by the United States. Toward the close of 1899 it was reported that an unofficial offer had been made by Denmark to sell the islands to the United States for \$3,000,000. In the same month (December) there were rumors that Germany was negotiating for the islands, but later in the month it was announced that that government would enter upon no course that might be regarded as an infringement of the Monroe Doctrine. It was thought in some quarters that the question of purchasing the islands would be brought before the Fifty-sixth Congress. Three times already there have been negotiations between Denmark and the United States for the transfer of the sovereignty of the islands. A treaty to this effect was made by Secretary of State William E. Seward in 1865, but was rejected by the Senate. Again in 1892 and shortly before the Spanish-American war efforts were made in the same direction.

The islands have a total population of 35,156, apportioned as follows: St. Croix, area 74 square miles, population 19,783; St. Thomas, area 23 square miles, population 14,389; St. John, area 21 square miles, population 984. The chief towns are Christianstadt, St. Croix, and Charlotte Amalie, St. Thomas. The inhabitants are chiefly negroes engaged in sugar culture, and sugar and rum are the leading exports. The imports and exports in 1897 amounted to 409,000 kroner (\$109,612) and 136,000 kroner (\$36,448) respectively. It is said that on account of the exclusion of the sugar of these islands from the United States market they have become a source of expense to Denmark.

DARFUR occupies a western portion of eastern Soudan, lying just north of the Bahr-el-Ghazal province, and east of Wadai. Its area is estimated at about 200,000 square miles; population, 1,500,000. England's influence there was settled by agreements with Germany and Italy in 1890-91. England's claim is further strengthened by her position in Egypt as a guarantor of the restoration to the latter power of her authority over the lost provinces of the Soudan. The recent French expedition toward the Nile, resulting in the Fashoda incident, disclosed a purpose of encroachment in the Soudan on the part of France, and resulted in an Anglo-French treaty, signed March 21, 1899. By this treaty the hitherto undefined western limit of the Soudan was definitely fixed, England agreeing not to acquire either territory or influence to the west of this new line of frontier, and France agreeing not to encroach upon the territory to the east.

DARLINGTON, SMEDLEY, ex-member of Congress, died at West Chester, Penn., June 24, 1899. He was born in 1827; in early life he was a school-teacher and newspaper reporter. He subsequently became a successful cattle dealer, and afterward a speculator in oil. He became prominent both in financial and in political circles, and in 1888 was elected to Congress, as a Republican, from the sixth Pennsylvania district.

DARTMOUTH COLLEGE, at Hanover, N. H., founded in 1769, reported in June, 1899, that the academic year just finished was the most prosperous one in its history. The curriculum had been broadened and so altered as to make it more freely elective, the teaching force had been increased, the erection and improvement of buildings had been continued, the endowment of the college had been enlarged, the alumni associations had increased in number, and a general improvement in scholarship standards was to be noted. A chair of modern history was established, to which Justin H. Smith, '77, of Boston, was elected. On September 19 the college received from Edward Tuck, class of 1862, in memory of his father, the Hon. Amos Tuck, class of 1835, who was a trustee of the college 1857-66, a gift of \$300,000, to be known as the "Amos Tuck Endowment Fund," the income from which is to be used exclusively for purposes of instruction. For statistics see UNIVERSITIES AND COLLEGES.

DARWINISM. See ZOOLOGICAL LITERATURE (paragraph General Treatises).

DASHIELL, ROBERT B., assistant naval constructor, with rank of lieutenant, U. S. N., died in Washington, D. C., March 8, 1899. He was born in Maryland in 1861, and was educated at the Naval Academy, Annapolis. He was recognized as an

expert on ordnance and was the inventor of the breech mechanism, gun mounts, and the ammunition hoist which bear his name.

DATE LINE, INTERNATIONAL. See INTERNATIONAL DATE LINE.

DAUGHTERS OF THE AMERICAN REVOLUTION, a patriotic women's society, was organized in Washington in 1890, and in 1899 had a membership of 27,000 in 492 chapters in 44 States and Territories. There are chapters in Hawaii, in England, and in Canada. Women descended from an ancestor who served in the colonies in military, naval, or civil capacity during the time of the Revolutionary War are eligible for membership. President-general, Mrs. Daniel Manning; corresponding secretary-general, Mrs. Kate Kearney Henry, 902 F Street, Washington, D. C.

DAUGHTERS OF THE KING, organized in the Protestant Episcopal Church in 1885, for the purpose of spreading "Christ's Kingdom among young women," received 968 new members in 1899. President, Mrs. E. A. Bradley; secretary, Miss Elizabeth L. Ryerson, 281 Fourth Avenue, New York City.

DAUGHTERS OF THE REVOLUTION, a women's patriotic society, was organized in New York City in 1891, and has branch societies in a number of the States of the Union. President-general, Mrs. Henry Sanger Snow; corresponding secretary-general, Miss Virginia S. Stirling. Headquarters, 156 Fifth Avenue, New York City.

DAUNT, Major-General WILLIAM, C.B., an officer in the British army, died November 27, 1899. Born March 17, 1831, and educated at private schools, he entered the military service in 1848. From 1854 to 1856 he served with the Ninth Regiment in the Crimea, being present at the siege of Sebastopol. In 1879-80 he took part in the military operations in Afghanistan. He received decorations for meritorious services at Sebastopol and Kabul.

DAVIES, General THOMAS A., was born December 3, 1809; died at Ogdensburg, New York, August 19, 1899. He graduated from the Military Academy at West Point in 1829, and served during the year following at Fort Crawford, Wis., which at that time was a frontier post. He was then appointed quartermaster at West Point and subsequently resigned to enter business in New York. At the outbreak of the Civil War he entered the Union service as colonel of the Sixteenth New York Volunteers, and was ordered to the defence of Washington. In the Army of the Potomac he was placed in command of the second brigade of the fifth division, and was engaged at Centreville. In March, 1862, he was promoted to the rank of brigadier-general of volunteers, and was assigned to the command of the second division of the Army of the Tennessee. General Davies participated in the siege and battle of Corinth, and for "gallant and meritorious conduct" was brevetted major-general of volunteers. He soon after resigned and returned to New York.

DAWSON, Sir JOHN WILLIAM, C.M.G., LL.D., F.R.S., Canadian geologist and naturalist, died November 19, 1899, at Montreal. With his death there passed away one of America's most distinguished geologists. His investigations and discoveries covered the range also of natural history, including mineralogy, botany, and zoology. His discovery of the *Eozoön canadense* in the Laurentian limestone, claimed as the earliest known form of life on the planet, and suggesting for the first time the existence of life during the eoëzoic period, to which the primitive rocks belong, electrified the geological world. Some geologists still doubt, however, whether the eoëzoön is an organic structure. His discovery of the *Dendroplecton acadianum* located the first reptile remains found in the coal formation of America. The discovery of the *Pupa vetusta*, the first known palæozoic land-snail, is also inseparably associated with his name. In a monograph published by him in 1873, he raised the number of known species of the post-pliocene fossils from thirty to over two hundred. His *Air-breathers of the Coal Period* is a complete account to date of the fossil reptile and other land animals found in the Nova Scotia coal. His two volumes on the *Devonian and Carboniferous Flora of Eastern North America*, published by the Geological Survey of Canada, and illustrated from drawings by his daughter, are among the most important contributions yet made to the palæozoic botany of North America. His scientific achievements were more noteworthy because attained in the course of an active educational and administrative career. He did not resign the principalship of McGill University until 1893, or after nearly forty years of service. Sir William Dawson was among the last great scientists since Louis Agassiz to combat the Darwinian theory of the origin of species. *The Story of the Earth and Man*, 1872, was one of his earlier important works on this subject. He has been an indefatigable writer, teacher and lecturer for nearly half of a century, his books being many, and his minor articles reaching a vast number. He belonged to many learned societies in America and Europe, and received, besides his doctor's degree from the University of Edinburgh, many honors, including the Lyell medal of the

Geological Society of London. He was created Companion of the Order of St. Michael and St. George, was a fellow of the Royal Society, president of the Royal Society of Canada, and Fellow of the Geographical Society. In 1884 he had conferred upon him the dignity of Knight Bachelor.

DAY, WILLIAM R., ex-secretary of state, was nominated by President McKinley on February 25, 1899, to be United States circuit judge of the sixth judicial circuit. He was born at Ravenna, O., April 17, 1849; was graduated at the University of Michigan in 1870; was admitted to the bar in 1872, and began practice at Canton, O. From 1886 to 1890 he was judge of the Court of Common Pleas; was appointed in 1889 judge of the United States District Court for the Northern District of Ohio, but declined the office on account of poor health. In March, 1897, he became assistant secretary of state; on April 26, 1898, succeeded Mr. John Sherman as secretary of state, and in the following September was succeeded by Colonel John Hay, his resignation being occasioned by his appointment to the chairmanship of the United States commission, which, with the Spanish commission, drew up the treaty of peace at Paris.

DEATHS. See ALCOHOL; VITAL STATISTICS.

DE GOESBRIAND, The Rt. Rev. LOUIS, Bishop of the diocese of Burlington, for many years the head of the Roman Catholic Church in Vermont, died November 3, 1899. He was born in Brittany, France, and was eighty-three years old. On the erection of the diocese of Cleveland, Bishop Rappa appointed Father DeGoesbriand his vice-general and rector of his cathedral. In 1853 he was ordained bishop, and placed over the newly erected see of Burlington, Vt. At that time there were in the State but eight churches and five priests, and no Catholic school or institution of any kind.

DELAGOA BAY indents the eastern coast of Portuguese East Africa. At the northern end on the eastern side of a landlocked inlet is the town of Lorenzo Marques, one of the chief ports of South Africa, and having special importance from the fact that it is the nearest seaport to the Transvaal, being some 52 miles from the Transvaal frontier and 350 miles from Pretoria, with which it is connected by rail. In 1899, at the time of the war between England and the Transvaal, many rumors were circulated in regard to designs on the part of Great Britain upon Delagoa Bay. The route from Lorenzo Marques to the Transvaal was the only route to the latter republic which was not under England's control. The possession of the bay and port by Portugal proved to be a great embarrassment to England and a corresponding advantage to the Transvaal, since its neutrality made it impossible for England to blockade the coast and prevent the shipment of goods to the enemy. The seizure by a British cruiser of a cargo of American flour on board a German vessel occasioned much comment at the time as a transgression of international law, and the United States State Department required its agent to investigate the matter. At the close of 1899 it was rumored that Great Britain had entered into an agreement with Germany and Portugal which would divide between Germany and England the colony of Portuguese East Africa, giving to Great Britain the country around Delagoa Bay, but the truth of this was denied from official sources. The only right which Great Britain possesses in connection with Delagoa Bay is the right of pre-emption. The origin of this was as follows: As far back as 1822 it was reported that an exploring party had secured a concession of Delagoa Bay from a native chief, and on the strength of this alleged concession Great Britain claimed the bay from Portugal. This claim was resisted and was referred in 1875 to the arbitration of Marshal MacMahon, president of the French Republic, who three years later awarded the territory to Portugal. The award contained a provision that the unsuccessful power should have from the successful power the right of pre-emption as against any other state desiring to purchase the territory. Since then there have been many reports that Great Britain had purchased the bay, but in each case they proved to be without foundation, the national pride of Portugal having stood in the way of giving up the bay to a great power. Of recent years the Delagoa Bay Railroad has been the subject of international dispute. This line, extending from Lorenzo Marques to Pretoria, was built by a citizen of the United States, who obtained a concession from Portugal in 1883, and began the construction four years later. He died before the work was finished, and the Portuguese government, taking advantage of the technical invalidation of the contract, confiscated the line in 1889. The shareholders protested, and the governments of England and the United States took up the matter, with the result that Portugal consented to arbitration. A tribunal of arbitration met at Berne in Switzerland, and the case was still pending in 1899. In the meanwhile the road was opened for traffic in 1894.

DELAWARE, an eastern State of the United States, has an area of 2050 square miles. The capital is Dover.

Manufactures.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$221,883. There were 41 single-account cigar manufactories, which used 65,946 pounds of tobacco, and had an output of 3,297,182 cigars. Fruit and grain distilleries in operation numbered 14, and the production of fruit brandy amounted to 1222 gallons. Delaware, the District of Columbia, and Maryland constitute one collection district, and further consolidated details will be found under the latter State.

Railways.—No new construction was reported in 1899, when the total mileage was 350.11.

Banks.—On October 31, 1899, there were 19 national banks in operation, the full number organized. The aggregate capital was \$2,133,985; circulation, \$767,327; deposits \$5,927,484, and reserve, \$1,712,057. The State banks, June 30, 1899, numbered 3, and had capital, \$500,000; deposits, \$1,200,000, and resources, \$2,234,300; loan and trust companies, 3, with capital, \$1,050,000; deposits, \$3,818,039, and resources, \$5,237,355; and mutual savings banks, 2, with depositors, 15,641; deposits, \$4,512,769, and resources, \$5,247,409.

Education.—At the close of the school year 1897-98 there were 14 public high schools, with 47 secondary teachers, 1104 secondary students, and 103 elementary pupils; 3 private secondary schools, with 16 teachers, 229 secondary students, and 177 elementary pupils; 1 public normal school, with 2 teachers and 24 students, and a private one, with 3 teachers and 42 students. Two colleges for men and for both sexes reported 20 professors and instructors, 138 students, 10,500 volumes in the libraries, \$23,000 in scientific apparatus, \$101,500 in grounds and buildings and \$83,000 in productive funds, and \$44,869 in total income. The last published report gave the value of all public school property as \$904,426. In 1899 there were 42 periodicals, of which 6 were dailies, 29 weeklies, and 5 monthlies.

Finances.—The last assessed property valuation available at the time of writing was that reported in 1897, which gives the total assessed valuation at \$77,632,079. The last county valuations available are: Kent, 1897, \$14,282,672; Sussex, 1897, \$10,576,232, and New Castle, 1899, \$46,196,481. On March 1, 1899, the total liabilities of the State were \$819,750; assets, including bank stocks, railroad mortgages, and miscellaneous bonds, \$1,169,419; excess of assets over liabilities, \$349,669.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 188,000.

Whipping-Post Legislation.—The friends of the Delaware Union for Public Good scored a noteworthy advance in the movement for the abolition of the whipping-post, an institution long associated with the penology of the State. Heretofore it has been claimed that, as the county jails of the State were without labor or reformatory discipline, the whipping-post was necessary to deter criminals from other States seeking asylum therein. Under the direction of Chief Justice Love, a bill providing for a State work-house, in which modern prison methods should supersede the old county-jail system, was introduced in two legislatures, only to be defeated in each. At the session of 1899 the bill was again introduced and adopted. Then it was found that the new constitution forbade a State appropriation for such an institution excepting by a three-fourths vote, which it was not deemed wise to risk. Whereupon Judge Love substituted an amended bill, making the proposed institution a county instead of a State one, and secured its passage with an appropriation of \$100,000. When the new work-house is completed the advocates of the whipping-post will have lost their chief argument for its retention.

New Incorporation Law.—Another important measure adopted by the legislature of 1899 was a law for the encouragement of the chartering by the State of corporations representing unusually large combinations of capital or industrial interests. Both Delaware and West Virginia took the cue from New Jersey. From March 10, when the law was adopted, till mid-October, out of all companies incorporated in Delaware, 31 represented an authorized capital of \$250,700,000. The largest were the Union Steel and Chain Company, \$60,000,000; the United States Vehicle and the Federal Sewer Pipe Companies, each \$25,000,000, and the American Grass Twine, American Pneumatic Service, and the Pennsylvania Milk Companies, each \$15,000,000. Of those below the last figure, one was for \$12,000,000, another for \$10,000,000, eleven between that and \$1,000,000, and thirteen for \$1,000,000 each. The incorporating of such companies, which was kept up fairly well through the year, proved a very profitable industry for the State.

Other Legislation.—Besides the legislation mentioned above, the following legislative measures may be noted: A State Board of Agriculture and Horticulture was created, and orchards and nursery stock will be inspected and penalties inflicted upon those selling stock subject to pests, insects or disease. The State Board of

Health was authorized to establish a pathological and bacteriological laboratory to prevent the spread of infectious diseases.

The Deadlock in the Legislature.—The balloting to elect a successor to United States Senator George Gray, whose term of office expired March 3, 1899, began on January 16, with 31 Republicans and 21 Democrats on joint ballot. Senator Gray was nominated by the Democratic members, and John Edward Addicks by the Union Republicans, and twenty-five other candidates also received votes. On March 1, Senator Gray was withdrawn as a candidate on account of his appointment to a United States judgeship. Mr. Addicks was voted for on every day of the contest, beginning with 15 on the first ballot and ending with 21 on the last ballot. In all, 133 ballots were taken, but the legislature adjourned *sine die* on March 13, 1899, with the vacancy unfilled. It has been the custom for the Senate to refuse to honor appointments made by governors after the adjournment of legislatures which have failed to fill senatorial vacancies occurring in the regular way at the end of full terms, and in that case Delaware will have but one senator for the next two years. It is thought that if senators, like governors, could be elected by the direct vote of the people, it would be a great relief, and legislatures could then be chosen to attend to law-making and State business rather than to forward the personal ambitions of candidates for the United States Senate.

State Officers and National Representatives.—Governor, E. W. Tunnell; secretary of state, James H. Hughes; treasurer, L. H. Ball; commissioner of insurance, Edward Fowler; attorney-general, Robert C. White; auditor, J. H. Lingo; adjutant-general, Garrett J. Hart. Supreme Court: Chief justice, Charles B. Lore; associate justices, Ignatius C. Grubb, W. C. Spruance, James Pennewill, William H. Boyce; clerk, William Viridin. The State legislature consists of 21 Democrats and 31 Republicans. Senators: Richard R. Kenney (Dem.), from Dover; the other senatorship (Rep.) not yet filled. Representative: John H. Hoffecker (Rep.), from Smyrna.

DELEBRUCK, HANS, a political and historical writer, who in 1899 was prosecuted for criticising the German policy of expelling the Danes from Schleswig-Holstein, has been a professor in the University of Berlin since 1885. He was born in Bergen (island of Rügen), November 11, 1848. He studied history in Heidelberg, Greifswald, and Bonn, after which he served in the war of 1870. In 1874 he taught Prince Waldemar of Prussia, the third son of the Crown Prince, until the youth's death in 1879. In 1882 he served in the house of delegates, and in 1885 in the *Reichstag*. He is the author of several books, and has been connected with important journals, including the *Politische Wochenschrift* and the *Preussischen Jahrbücher*.

DELCASSÉ, THÉOPHILE, French minister for foreign affairs, was born in Pamiers, March 1, 1852, and began life as a journalist on the staff of *La République Française*, where he wrote of foreign politics. In 1889 he entered the Chamber from Foix; in 1893 he became under secretary of the colonies; in 1894, minister of the colonies in the Dupuy cabinet, and in 1898 minister of foreign affairs in the Brisson cabinet, and dealt with the difficult question of Fashoda. In 1899 he negotiated an agreement with England regarding the Nile Valley and Central Africa. M. Delcassé was retained as foreign minister in the Waldeck-Rousseau cabinet, formed in 1899. See FRANCE (paragraphs on History).

DEMANGE, CHARLES GABRIEL EDGARD, French lawyer, who, with Labori, served as counsel for Dreyfus in 1899, was born at Versailles, April 22, 1841, where his father, an officer in the French army, was in garrison. After studying at the Lycée of Nancy, young Demange read law in Paris, and was admitted to the bar in 1862. In 1865 he obtained the *prix Lionville*, and from that time forward took the highest rank among the lawyers of the *cour d'assises* and plead some of the most important criminal affairs of the time. M. Demange has also been engaged in notable civil cases. In 1899 his name was brought before the whole world, owing to the Dreyfus affair. See FRANCE (paragraphs on History).

DEMOCRATIC CLUBS, NATIONAL ASSOCIATION OF, organized in 1888, has now a membership of 750,000. President, Chauncey F. Black. Headquarters, Hutchins Building, Washington, D. C.

DENBY, CHARLES, former United States minister to China, was a member of the Philippine commission, whose appointment was announced by President McKinley on January 17, 1899. He was born at Mount Doy, Va., in 1830, and was educated at Georgetown University, from which he received the degree of LL.D. in 1895, and at the Virginia Military Institute. After graduation he taught school for two years, studied law, and in 1852 removed to Evansville, Ind., where he practised his profession. During the Civil War he served in the Union army, and was advanced from lieutenant to colonel of the Forty-Second Indiana Volunteers, and

was later colonel of the Eightieth Indiana Volunteers. On account of wounds he was finally forced to resign his commission. In 1885 President Cleveland appointed him minister to China, in which position he remained until the early part of 1898, when he was succeeded by Mr. E. H. Conger. Mr. Denby had an important part in the negotiations that ended the Chino-Japanese war in 1895. In September, 1898, he was appointed by President McKinley a member of the commission to investigate alleged mismanagement in the War Department during the war with Spain. For an account of the commission appointed to investigate conditions in the Philippines, see UNITED STATES (paragraphs on History).

DENMARK, the smallest of the three Scandinavian kingdoms, is bounded on the north and west by the North Sea, on the east by the Cattegat, the Sound, and the Baltic Sea, and on the south by the German States. Its area, including the Farøe Islands, and the islands of the Baltic Sea, is 15,289 square miles, and it has a population, exclusive of the colonies, of about 2,300,000 inhabitants, almost entirely Scandinavian. Copenhagen, the capital, had a population in 1890 of 375,000, including the suburbs. Other principal towns are Aarhus, 33,308; Odense, 30,277; Aalborg, 19,503; Horsens, and Randers.

Production, Industry, and Commerce.—Dairy farming is one of the chief occupations. Agricultural production along certain lines is not equal to home consumption, especially in cereals, the imports of which exceed the exports. Corn is an article quite largely imported from the United States. The United States consul at Copenhagen reports serious complaints recently made against the inspection of corn leaving American ports. It was charged that certain shipments of corn have included much dust, dirt, sand, and other foreign material, effecting an increase in weight in the shipment, and damaging the corn. Cauliflower seed has recently gained importance as an article of export from Denmark, whose soil and climate favor the production of this plant and seed. The Royal Danish Ministry of Finance in August, 1899, appointed a commission to consider and report on the question whether or not protection, by duties on foreign agricultural products, would be of advantage to Danish agricultural products, and how such protection could be carried out. One of the most interesting questions connected with Danish commerce for 1899 was the great diversion of trade to sources other than Germany, and the possibilities for new trade thus opened up to other countries. It was stated that the recent expulsion of unoffending Danish subjects from Schleswig-Holstein had so stirred the patriotism of the Danes that rather than buy anything German they are gladly paying more for the goods of other countries. A special despatch to the same paper from Copenhagen stated that trade with Germany had already fallen off to the value of \$7,500,000 to \$10,000,000, compared with the previous year. One article—horseshoes—formerly imported into Denmark from Germany, was cited as an example, the value of its importation having fallen off \$250,000. It is now imported from Norway. Norwegian and to some extent Swedish merchants, it is reported, have joined in this trade war. The results offer a good opportunity for foreign countries, including the United States, to make an entrance for goods not now imported. There seems to be an especial future for American trade in Denmark. This country was fifth among the countries exporting goods to the Danes in 1896. In 1897 her place was fourth, supplanting Russia. While the trade of the latter, with that of Great Britain, Germany, and Sweden and Norway, increased little or not any, the import trade from the United States almost tripled in value in 1897. In the amount of goods exported to the United States from Denmark, this country advanced from seventh to sixth place in importance, supplanting France. As a sure sign of the increasing business relations thus noted, the United States Consular Reports for September, 1899, stated that the Copenhagen Bourse has been instructed by royal decree to quote the rate for three days' sight-drafts on New York every Tuesday and Friday. The exchange rate on places in the United States has never before been publicly quoted in Denmark. The expansion of the Danish merchant marine has been an important factor in the increase of American trade. An increase of 49 vessels, with a net tonnage of 50,000, was made to the merchant marine for 1898 alone, and nearly half of this increase was placed on the routes between Denmark and the United States. The decrease in the Danish fleet for 1898 was 17 steamers of 7000 tons net, but none of them was on an American line. The Danish merchants have for many years complained about the Danish weights and measures in use, as they do not agree with those ruling in other countries. A bill was introduced into the Danish Diet late in 1898 recommending the introduction in Denmark of the metric weights and measures system.

Finance.—The estimated revenue for the year 1898-99 was 68,568,723 kroner; the expenditure, 68,430,032 kroner; the abstract for the budget of 1899-1900 shows 68,162,192 kroner for revenue, and 67,970,912 kroner for expenditure.

Army and Navy.—The Danish army may comprise all able-bodied men who are 22 or more years of age. Such men are liable to serve for eight years in the regular

army and its reserve, and for eight years in the extra reserve. The strength of the army in 1899 was 800 officers and 9000 men, with a war footing of 1350 officers and 58,600 men, or, including the Citizens' Corps of Copenhagen and Bornholm Island, 63,300 men. By the working of changes begun in 1894, it is expected that by 1910 Denmark will have an effective force of 83,000 men. The Danish navy is maintained for coast defence purposes. Its fleet consisted in 1899 of 4 coast defence armorclads; 1 turret-ship, 1 barbette-ship, 1 torpedo-ship, 6 third-class cruisers and gun-vessels, 7 gunboats, and a flotilla of 14 first-class and 20 second-class torpedo-boats. There are also building at Copenhagen two armored ships, of 3470 tons each.

HISTORY.

Labor Interests.—The chief event of the year 1899 was the occurrence of one of the most extensive lockouts of recent years. It involved in the course of the summer some 35,000 men, and before it came to an end the number rose to 50,000, an extraordinary figure when compared with the population of Denmark. Among the general causes of the lockout may be mentioned the fact that the good industrial conditions that had prevailed for some years in Denmark provided the workingmen with means for a struggle like this, at the same time that it gave them confidence in their own strength. During the last few years the work of organization has been going on among them until they have achieved a greater degree of solidarity than prevails among their employers. Their critics have blamed them for a desire to show their power, and to interfere unwarrantably with the management of business. Strikes have been frequent during recent years, and many of them have resulted in an increase of wages. This is said to have encouraged the workmen to take an aggressive attitude. In April, 1899, several unions of joiners went on a strike over a matter of wages, but without consulting their central committee. The latter, however, took charge of the affair and entered into an arrangement with the committee of employers regulating the rates. The members of the unions now refused to accept this settlement, whereupon the employers and master joiners declared a lockout of the workingmen belonging to the unions. The central committee of the workingmen tried anew to bring about a settlement, but the federation of joiners in Copenhagen refused to submit. The employers now published a statement of their position. They were ready to consider the means of putting an end to the lockout, but only on condition that certain principles should be accepted by the workingmen. The chief of these principles were that any agreement concluded between the central committees of employers and workingmen should be accepted by both sides; that the employers, master joiners, and directors should have the right of controlling the work and fixing the number of operators in their shops, and that foremen employed under special contract cannot belong to any labor union. These demands were indignantly rejected by the workingmen, and the lockout continued in force. It extended to fourteen branches of the building trades. Its effect in Copenhagen was most striking. Buildings were left half finished, and many a large business came to a standstill. But in spite of the long duration of the lockout, there was no evidence of violence, and no occasion for the authorities to interfere. It was estimated that in Copenhagen alone from 26,000 to 27,000 women and children were supported at the expense of the union committees. The workingmen found sympathizers among the other classes, and a number of prominent men of letters called meetings of the idle laborers, and induced them to pay visits to the museums and art schools of the city. The workingmen's unions which were not involved in the lockouts turned over a large part of their earnings to the support of those without employment. On the whole, the event bore striking testimony to the unity and excellent organization of the federations, and the lockout added little, if anything, to the burden of the city's charity administration. The employers lost heavily through their inability to fulfil building contracts. Several efforts were made toward conciliation. A common committee, made up from the central committees of employers and workingmen, served as a court of arbitration, but without results. The employers refused to depart from the essential conditions above stated, and the workingmen would not accept these terms. In the summer of 1899 several of these conciliatory attempts were made without success. The employers now extended the lockout to several other branches of industry. After this there was a tendency toward compromise, in spite of the threat of a general strike which was made by the socialistic press. At last, on September 4, the two parties to the dispute agreed upon the terms of peace. These terms were favorable to the employers, although they were expressed in such a manner as not to offend the workingmen. The principles of the agreement were as follows: First, every settlement concluded between the central committees of the two parties must be accepted by all the federations on each side; second, the employers shall have the right to direct and distribute work and to fix the number of workingmen employed in every instance; third, foremen employed under special contract shall not be obliged to belong to the workingmen's unions.

Parliamentary Affairs.—In the summer of 1899, M. Hoerring, the premier, influenced by the wishes of the majority in the chamber of deputies, replaced the unpopular ministers of the interior and war by new members. M. Bramsen, a former deputy, became minister of the interior; Colonel Schnack became minister of war, and M. Hoerring assumed the portfolio of justice in addition to that of finance, which he already had. The chief matter to come up before this ministry is the question of reform in judicial procedure. According to the fundamental law of the kingdom, the administration of justice must be separated from the executive department according to certain rules set forth by law, and it was further provided that publicity and oral procedure should be introduced as soon as possible, and that juries should be employed in criminal and political trials. These requirements were repeated in the revised fundamental law of 1869, but in 1899 they were still inoperative. In 1892 a committee of jurists published projects of reform dealing with the functions of judicial officers and the organization of procedure in criminal and civil cases. These matters were still awaiting settlement at the close of 1899. The old question of the respective rights of the *Landsting* and *Folkething* was prominent in 1899. According to the Danish constitution, the *Landsting*, or senate, which represents the conservative interests, has about the same rights as the *Folkething*, whose members are directly elected. Nevertheless, for many years the cabinets appointed by the king represented the Right, which was the majority in the *Landsting* alone. For nineteen years the cabinet of M. Estrup ruled, though supported only by a parliamentary minority. The succeeding cabinet, that of Reedtz-Thott, was a compromise and rather weak body. Latterly the Radicals and Socialists have become the dominant element in the chamber of deputies, and make the most of their opportunity for attacking the policy of the government. The Hoerring cabinet has shown a willingness to govern so far as possible in accordance with the wishes of both parties, but the hostility of the Radicals was evident as illustrated in 1899 by the discussion on the budget. In 1898 the cabinet had authorized the minister of war to appropriate the sum of 500,000 kroner to the fortification of Copenhagen without waiting for parliamentary sanction. When the chamber of deputies met in 1898 it condemned the action of the government, and in 1899 the debate on the subject was renewed. The matter, however, was not regarded seriously, and in general it was thought best to postpone discussion to October, 1900, when the report of the government on its disbursement of public funds would offer the fit occasion for a criticism of its policy. The subject of old-age pensions came up for discussion in 1899 in connection with a new measure supported by the Socialists. The existing law granted a pension to every person sixty years of age who is unable to procure the means of subsistence, provided such person has not committed a crime or been on the poor rates, and that his poverty be not the result of the giving of his property to his parents. The commune in which the aided person is a resident pays the pension, but one-half of the expenses of the communes are paid by the state. The criticism of the law has been that it gives money to the idle, and that it removes from the poor incentives to saving. The new bill would have greatly added to the amount of pensions. The debates on the measure resulted in much criticism of the existing law, but its fate was undecided at the close of the session.

DENNERY, or D'ENNERY, ADOLPHE PHILIPPE, one of the most prolific playwrights of the century, died in Paris, January 25, 1899. He was born of Jewish parents in Paris on the 17th of June, 1811. He attempted painting and journalism, but finally turned to dramatic work, in which he was eminently successful. His first work, written in collaboration with Charles Desnoyer, and entitled *Emile, ou le Fils d'un Pair de France*, was produced in 1831. His dramatic works, many of which were written in collaboration with other littérateurs, numbered in all about two hundred, and included comedies, vaudeville sketches, and dramas. There were times in 1862 and 1863 when five of his plays were being presented at the same time in as many Parisian theatres. In the latter part of his career he devoted some time to business and to theatrical management. Among his best known works are: *La Changement d'Uniforme*; *Une Cause Célèbre*, in collaboration with M. Mallian; the libretto of Massenet's opera *Le Cid*, in collaboration with Ed Blau and Louis Gallot; *Don Cesar de Bazan*, in collaboration with M. Dumanoir; and, together with M. Jules Verne, the dramatic versions of *Michael Strogoff* and *Le Tour du Monde en quatre vingt Jours*. Among other collaborators with Dennery were Alexandre Dumas, Gustave Lemoine, Grangé, Dugué, Plouvier, Dartois, Decourcelle, Foucher, Bresil, and Brisebarre.

DENTAL ASSOCIATION, NATIONAL, formed 1897, is composed of delegates, permanent members, and honorary members, and had in 1899 a membership of 500. President, B. Holly Smith, Baltimore; secretary, Emma Eames Chase, St. Louis, Mo. General meeting for 1900, Old Point Comfort, Va., June 26-29.

DEPEW, CHAUNCEY MITCHELL, LL.D., long prominent as an orator and railroad president, was elected as a Republican on January 18, 1899, to succeed Mr. Edward Murphy, Jr., Democrat, in the United States Senate, the vote of the joint convention of the legislature being 111 to 83. Mr. Depew was born in Peekskill, N. Y., April 23, 1834, graduated at Yale in 1856, and two years later was admitted to the bar, and in 1859 began practice in Peekskill. In 1861 and 1862 he was elected assemblyman, and in 1863 secretary of state. He was made attorney for the New York and Harlem Railroad in 1866, and for the New York Central and Hudson River Railroad in 1869, and in 1875 became general counsel for the entire Vanderbilt system of railways. He became second vice-president of the Central in 1882, and three years later succeeded to the presidency, which position he retained until 1898, when he took the place of the late Cornelius Vanderbilt as chairman of the entire Vanderbilt system of railroads. The presidency of the Central was conferred upon Mr. Samuel R. Calloway, president of the Lake Shore and Michigan Southern. Since 1860 Mr. Depew has been active in Republican politics, and in 1888 was a candidate for the presidential nomination. Senator Depew has a wide reputation as an able orator and clever after-dinner speaker. His term of office in the Senate will expire March 3, 1905.

DERMATOLOGICAL ASSOCIATION, AMERICAN, organized in 1876, had 41 members in 1899. Next annual meeting, Washington, D. C., May 1-3, 1900. President, Henry W. Stillwagon, M.D., Philadelphia; secretary, F. H. Montgomery, M.D., 100 State Street, Chicago.

DÉROULEDE, PAUL, the French politician, journalist, and Nationalist leader, who, in 1899, was arrested with Marcel-Habert and Millevoye for having incited disorder on the occasion of President Faure's funeral in Paris, is the nephew of Emile Augier, and was born in Paris, September 2, 1846. After receiving his education in the Lycée Louis le Grand, he travelled extensively in Europe and began to write. His drama, *Jean Srenner*, was represented at the Théâtre Français in 1869, and his *Hetman* at the Odéon in 1877. In 1882 he founded the Ligue des Patriotes, to unite Frenchmen in a desire for revenge. He tried to arouse enmity against Germany in Russia in 1883, and in 1884 supported General Boulanger. In 1889 he entered the Chamber, but was expelled in 1890 and resumed his literary work. Again he wrote a play, *Bertrand Du Guesclin*, which was patriotic and which found representation at the Ambigu in 1895. He was a violent anti-Dreyfusard, and early in 1899 was arrested and imprisoned for seditious conduct when Loubet was elected president of the French Republic. In 1899 he also published *Histoire d'Amour*. Two volumes, *Chants du Soldat* (1872 and 1875), became extremely popular in France. They were inspired by experiences at Sedan, where Déroulède was wounded, and by the Loire campaigns, in which he also fought. M. Déroulède is regarded as "the finest specimen of the French Chauvinist."

DESCHANEL, PAUL EUGÈNE LOUIS, president of the French Chamber of Deputies, and one of the most distinguished Socialists of the hour, was born in Brussels, February 13, 1859. He was educated at the Lycée Ste. Barbe and the Lycée Condorcet; was secretary to Marcère and Jules Simon when they were ministers of the interior; was sous-préfet of Dreux, Brest, and Meaux; and in 1881 ran for parliament, but was defeated. In 1885 he was elected from Eure-et-Loire as a moderate Republican, and immediately distinguished himself as an orator. The Sultan of Turkey decorated him with the Grand Cross of the Medjidie, and made him Grand Officer of the Osmanieh in 1883 after his speech on French interests in the East. In 1889 he was returned, and in 1891 he visited the United States on official business. In 1898 M. Deschanel was chosen by the Moderates to oppose Henri Brisson, and was elected. He is a frequent contributor to the *Débats* and *Revue Politique*, and has written several books. These include: *La Question du Tonkin*, Paris, 1883; *La Politique Française en Occanie*, with preface by M. de Lesseps, 1884; *Les Intérêts Français dans le Pacifique*, 1885; *Orateurs et hommes d'Etats*, 1888; *Figures de femmes*, 1899; *Figures littéraires*, 1889, and *Questions actuelles*, 1891. His last work is *La République Nouvelle*.

DESIGN, NATIONAL ACADEMY OF, founded 1826, in 1899 had 98 members. The academy maintains an art school, has a library of works on art, and holds two annual exhibitions, spring and autumn, at Fourth Avenue and Twenty-third Street. In 1899 the art school was moved to a temporary building at the new site, One Hundred and Tenth Street and Amsterdam Avenue. President, Frederick Dielman; corresponding secretary, Harry W. Watrous, 58 West Fifty-seventh Street, New York City.

DEWEY, GEORGE, Admiral of the United States Navy. The hero of the battle of Manila was in the fall of 1899 more prominently before the public than any other American in official life. He received a popular welcome upon his return to this

country, such as had never before perhaps been accorded any American army or navy officer.

Significance of the Dewey Celebrations.—Americans held Dewey in high esteem not merely because he entered the mined harbor at Manila and sank the Spanish fleet, but because by his subsequent official conduct he showed himself a diplomatist of a high order. He made himself popular by remaining in the Philippines, in spite of ill health, long after the surrender of Manila, because he felt that his presence was required there. Besides the personal qualities of the admiral, the Dewey festivities celebrated the new position in world affairs which it was felt his victory had given to America, an aspect of his work which unquestionably increased the enthusiasm with which the newly created admiral of the United States Navy was received.

The Return of Admiral Dewey from Manila.—It was nearly a year and a half from the entrance of the American fleet into the harbor of Manila before Admiral Dewey was detached from the squadron and started on his return to the United States. When, finally, he decided to come back by way of the Suez Canal, rather than overland from San Francisco, as the West had desired, the chronicles of his progress were cabled from every port he touched, from Manila, through Ceylon and Gibraltar to New York. Notwithstanding this, he arrived in New York two days before he was expected.

Celebration at New York.—Preparations elsewhere in the country were quite overshadowed by the extraordinary preparations at New York. The *Olympia* anchored in the lower bay of the harbor in the early morning of Tuesday, September 26, and the commander was at once greeted by the formal salutes due his rank. During the day he was welcomed by Rear-Admiral Sampson, of the fleet, and Rear-Admiral Philip, commandant of the navy-yard, and by the city's committee, while all over the country his arrival was made known by bells and whistles. On Wednesday he passed the harbor forts and placed the *Olympia* at the head of the waiting war-ships of Admiral Sampson's squadron. On Thursday visits were received from a large number of officials, including Governor Roosevelt and General Miles. During the afternoon Commander Baird, who had fought with Dewey under Admiral Farragut at New Orleans, presented him with the faded blue flag which Farragut had flown from the flag-ship *Hartford* on that occasion. On Thursday evening 1200 singers of the People's Choral Union came to the *Olympia*.

The formal entertainment of Admiral Dewey by the city of New York began on Friday, September 29, and continued through September 30. These days were declared legal holidays by the city and by Governor Roosevelt for the State. Mayor Van Wyck visited Admiral Dewey on Friday morning to offer him the "freedom and unlimited hospitality of the city of New York," and to present to him a jewelled badge which the city had voted him. In the afternoon the great naval parade took place. The *Olympia* headed the line, leading the battle-ships and cruisers of Sampson's squadron, with other war-ships, escorted by nearly 400 yachts and excursion boats. The admiral walked the bridge of the flag-ship. The vessels sailed from the anchorage at Staten Island across the harbor and up the Hudson River to Grant's Tomb, where a salute in honor of the dead soldier was fired. Rounding the old school-ship the men-of-war anchored in mid-stream, and for two hours the various escorting vessels passed in review. The war-ships were illuminated in the evening and elaborate displays of fireworks were shown at various points about the Hudson and East rivers and New York Bay. The words "Welcome Dewey" shone in electric lights from the span of the Brooklyn Bridge. Over a million visitors are estimated to have been in the city on this day, and as many more on Saturday.

Saturday was the day of the land parade. In the morning Mayor Van Wyck presented a loving cup to Admiral Dewey in the name of the city. In a speech of acceptance the admiral called his captains about him and presented them to the mayor and audience as "the men who did it." In the land parade there were 31,000 men. Many naval and military officers, including General Miles and four rear-admirals, followed the admiral and Mayor Van Wyck in the line of carriages. The *Olympia* men led the main procession; Governor Roosevelt commanded 10,000 soldiers of the New York National Guard, and as many soldiers from other States followed the line of march. The celebration closed on Saturday night with an entertainment given to the *Olympia's* men at the Hotel Waldorf-Astoria.

It has been said that the pageant and decorations incident to the Dewey reception were superior to those of any similar fête ever held in this country. The keynote of the decorations was harmony, the central and enduring figure in the scheme being the creation of wood and staff known unofficially as the Dewey Arch. This monument was designed and executed by a group of eminent New York artists, who donated their work and time. A committee of well-known men from the Mural Society, headed by John La Farge, supervised the decoration of houses along the route. The arch, with its flanking pilasters, was planned by Charles R. Lamb in collaboration with a special committee of the National Sculpture Society, its prototype



THE DEWEY ARCH AND THE MILITARY PARADE.

being the Arch of Titus. The heroic group, "Sea Victory," surmounting the arch one hundred feet above the street, was designed by J. Q. A. Ward, and four other most striking groups were designed, respectively, by Philip Martiny, Daniel C. French, Charles H. Niehaus, and Karl Bitter. Most of the leading sculptors of the city are represented by the strikingly fine work on remaining portions of the arch or on the columns whose approaches accentuate the proportions of the main structure. The matchless beauty of the Dewey Arch gave rise to a public desire for its perpetuation in marble, and a popular subscription had already gained such proportions at the close of 1899 as to make it probable that New York would shortly possess a monument equal in dignity to and even more elaborate than the Washington Arch. See ARCHITECTURE.

Reception at Washington.—If the New York ceremonies were unprecedented in the history of the metropolis, so the Washington ceremonies, it has been said, were unprecedented in the history of the capital. On the Monday following the admiral's reception at New York, that officer was received at the White House by President McKinley and his cabinet, and on the following day escorted by them in public procession to the Capitol—an honor said never to have been paid before to any American. Eight or more State governors, with their staffs, also joined in escort. A sword, voted to him by Congress, was tendered him at the Capitol, Secretary Long and the President making addresses. On the same evening President McKinley gave one of the largest dinners in the history of the White House, covers for eighty persons being laid. Other events of the week at Washington were the admiral's formal acceptance of the house presented to him by the people through popular subscription, and his detachment, at his request, from the *Olympia*.

Receptions to Dewey in His Own State and Elsewhere.—The ceremonies at New York and Washington were followed by receptions given in honor of Admiral Dewey by his native town and State, by entertainments at his college, and in several cities, including Boston. At Montpelier, Vt., the place of his birth, Dewey reviewed on October 12 a parade in his honor, at which time he was presented with a jewelled badge by the State of Vermont. On the 13th Dewey laid the corner-stone of Dewey Memorial Hall at Norwich University, Northfield, where he had been a student in former days. On the same evening he was received by an assemblage of 25,000 people in Boston, and escorted by 10,000 war veterans to his hotel. The following morning he was escorted to the Common, where 25,000 school children sang patriotic melodies. At the city hall he received from Mayor Quincy a jewel-studded watch, the gift of the city of Boston. The *Olympia* men marched once more in the parade of the afternoon, and Admiral Dewey attended a banquet in the evening, returning to Washington on October 16, to take up his permanent residence there. The public receptions to Admiral Dewey might have continued during a still longer period had not his health required that he should retire for a time. Invitations other than those accepted were numerous, among the places planning entertainments in his honor being a number of Western and Southern cities.

The Dewey House and the Incident of its Transfer.—The gift of a house, which Admiral Dewey through a sense of delicacy had for a time hesitated to accept, brought about the only unpleasant incident in the relations of the admiral with the American people. Admiral Dewey had, some weeks after the close of his receptions throughout the country, been quietly married, his bride being the widow of General W. B. Hazen and the sister of John R. McLean, Democratic candidate for governor of Ohio. As a compliment to his wife Dewey transferred to her the deed of the new house. His action was greatly misunderstood by some of the contributors to the fund with which the house had been purchased. A not unnatural reaction from the abnormal excitement incident to Dewey's return and his reception in this country set in. The papers were for a time filled with protests against the transfer. Mrs. Dewey at once deeded the house to George Goodwin Dewey, the son of Admiral Dewey by the latter's first marriage. The newspaper agitation on the subject did not fairly represent intelligent public opinion.

As a Presidential Candidate.—Appreciation of the hero of Manila did not take the form of celebrations alone, there being widespread talk in the press, for a time, as to his possibilities as a Presidential candidate. He was mentioned principally as a candidate for the Democratic party, but as no one seemed to be certain that he was a Democrat, and as he stood for things which Democrats seemed unlikely to support, but especially because Admiral Dewey refused to consider any suggestion of the kind, the subject was not seriously discussed during the rest of the year.

DOUKHOBORTSI, or the **DOUKHOBORS**, are a Russian sect which resemble the Friends, or Quakers, in refusing to take up arms in warfare or to render military service. Hence they have been relentlessly persecuted by Russia, who banished 15,000 of them to Siberia in 1799. The Doukhobors, who call themselves the "Universal Brotherhood Christians," are communists, and do not believe in a personal God. They emphasize the quality of brotherly love and are apparently con-

sistent in their living, impressing every one with their honesty, industry, and gentleness. In 1868 about 15,000 members of this sect returned from Siberia to Russia, where they have subsequently undergone punishment, imprisonment, and further exile. In 1895 they made a final refusal to enlist in the military service of Russia, and thereby brought upon themselves excessively harsh and cruel treatment. Some of the more humane Russians interceded in their behalf at this juncture, and obtained permission from the Czar for the Doukhobors to emigrate at their own expense. The first company to go out from Russia was colonized in Cyprus, through the efforts of English and Russian sympathizers in England. The site of that settlement proved an unwise selection, owing to the climatic conditions, to which the colonists were unaccustomed, and Canada was selected as the place for future colonizations, and the eventual destination of the Cyprus settlers. The first settlement in Canada was recently made, three shiploads of immigrants having arrived. The party came in chartered vessels, which sailed from Batoum, on the Black Sea. Among those who had actively interested themselves in the Russian Doukhobots was Tolstoy, and his son was in charge of one of the divisions of the emigrating party. Seven thousand Doukhobors are now settled in Canada, and it is probable that one or more additional settlements may yet be made. It appears to be the opinion of observers that these people are a valuable acquisition to the country, being law-abiding and conservative, and of prepossessing appearance and manners. They are thrifty in habit also, although their present condition is one of poverty. Those in charge of the movement call for contributions to aid the Doukhobors in recovering the outlay made for transportation and in settling in their new homes. Their value as members of a community seems to be well shown by the fact that various efforts have been made toward inducing them to settle in parts of Canada elsewhere than where they are now located. See **TOLSTOY, LEO**.

DIALECT SOCIETY, AMERICAN, organized in 1889 to investigate dialects in the United States and Canada, has now a membership of 300. Publishes *Dialect Notes*. President, Lewis F. Mott; secretary, O. F. Emerson, Western Reserve University, Cleveland, O.

DIAMONDS have been found at several points along the glacial moraines of the western and northwestern States, and reasoning from the glacial scratches as indicating the direction of the ice-sheet which formed these moraines, Hobbs shows that they probably all came from a region to the east of James Bay, in the Canadian wilderness. The presence of diamonds has been noted from time to time in the gold placer deposits of California, and Turner enumerates six different counties comprising twelve localities.

DIELMAN, FREDERICK, American artist, who in 1899 was made president of the National Academy of Design, was born in Hamburg, Germany, December 25, 1847. He was brought to the United States at an early age, and after graduation at Calvert College went to Munich to study under Diez at the Royal Academy. In 1876 he opened his studio in New York, and in 1883 became a National Academician. He designed the mosaic panels of "Law" and "History" in the Congressional Library, has illustrated a number of books, and paints portraits, as well as historical and genre pictures.

DIET AND FOOD. See **FOODS**.

DINGLEY, NELSON, Jr., Republican member of Congress from the second Maine district, died in Washington, D. C., January 13, 1899. He was born at Durham, Me., February 15, 1832. After his graduation at Dartmouth in 1855 he studied law and was admitted to the bar, but left the profession in 1856 to become editor and proprietor of the *Lewiston Journal*, with which he maintained a connection until the time of his death. He was a member of the lower house of the Maine legislature in 1862, 1863, 1864, 1865, 1868, and 1873, and in 1863 and 1864 was speaker. He served as governor of his State in 1874-75, and in September, 1881, was elected to the Forty-second Congress to fill the vacancy occasioned by the election of Mr. William P. Frye to the United States Senate. Dingley was a member of the next Congress as a representative-at-large, and was re-elected to the succeeding Congresses up to and including the Fifty-sixth. He gave much attention to questions of American shipping and the protective tariff, and his work in Congress was ably and conscientiously performed. The present tariff schedule, which has been in force since 1897, was framed by him. He was a member of the commission that met at Quebec in August, 1898, and later at Washington, for the adjustment of differences between the United States and Canada, and at the time of his death he was chairman of the House Committee on Ways and Means. Dingley was recognized not so much as a man of legislative genius as one of untiring industry and unquestioned sincerity.

DIPHTHERIA. Expressions of doubt as to the efficacy of antitoxin are becoming rarer. Few points are better proved theoretically or practically than the value of diphtheria-antitoxin. During 1899 reports from various parts of this country and

from Europe agree in the statement that the former mortality of this disease has been about halved. The mortality from diphtheria in Denver, Col., before the introduction of antitoxin averaged 36.4 per cent. in 6 years, while since its introduction the mortality has been 11.57 per cent. in 4 years, in a total of 1177 cases. Of 607 cases treated with antitoxin the mortality reached 4.95 per cent. In San Francisco the mortality among 144 cases treated with antitoxin was 11.11 per cent. In Chicago the cases of true diphtheria treated by the Board of Health with antitoxin showed a mortality of 6.7 per cent., against a previous mortality of 35 per cent. without antitoxin. The death-rate from diphtheria in Paris has been reduced from 72.8 to 12 per 100,000 of population; in Berlin, from 125.7 to 32.4 per 100,000; in New York, from 187.5 to 45.1 per 100,000. The great reduction in the number of cases of diphtheria in New York in 1899 is ascribed to (1) the general use of antitoxin, which diminishes the severity of the cases, and thus diminishes likelihood of infection; (2) the employment of antitoxin as an immunizing agent; and (3) the more careful inspection of the schools. See SERUM THERAPY and VITAL STATISTICS.

DIPPEL, ANDREAS, German tenor, born in Cassel, Germany, November 30, 1866. He was educated at the Gymnasium of Cassel, and was employed in a banking-house for several years. He studied music in Berlin, Milan, and Vienna, and made his first appearance in Bremen in 1887, as the Steersman in *The Flying Dutchman*. Mr. Dippel has sung in Beyreuth, London, St. Petersburg, and Vienna with success, and added to his reputation in New York in 1890-92 and in 1898-99. He sings in several languages, and has a large repertoire, including Siegfried, Walter in *Die Meistersinger*, Erik in *The Flying Dutchman*, *Lohengrin*, *Tannhauser*, and many tenor rôles in the Italian and French operas.

DISARMAMENT. See HAGUE CONFERENCE.

DISCIPLES OF CHRIST, also known as the Campbellites, are a division of the Baptists. A "Jubilee Convention" was held in Cincinnati in October, which had an attendance of nearly 20,000 delegates. The Disciples of Christ reported for 1899 an increase of 210 churches and 42,781 communicants, and an increase in value of church property amounting to \$1,059,264. The total number of ministers in 1899 was 6339, with 10,298 churches and 1,118,396 communicants.

DISPENSARY ABUSE. New York City takes the lead in practical legislation to correct the abuses of dispensary management. In accordance with the bill passed by the State Legislature, April 18, 1899, and signed by the governor on the same day, the old system passed out of existence on October 1. The new law defines a dispensary as any person, corporation, institution, association, or agent whose purpose it is, either independently or in connection with any other, to furnish at any place or places, to persons non-resident therein, either gratuitously or for a compensation determined without reference to the cost or value of the thing furnished, medical or surgical advice or treatment, medicine or apparatus, provided that the moneys used by and for the purposes of said dispensary shall be derived wholly or in part from trust funds, public moneys, or sources other than the individuals constituting said dispensary. A license is necessary, and each applicant for license must take oath to the fact that the dispensary is for the public benefit; no school of medicine is obligatory, but the State Board of Charities is empowered to examine every dispensary and to move the revocation of any license which does not conform to law. No dispensary shall be conducted in a drug store or tenement house, and no person shall advertise a dispensary except one duly licensed. Violation of the law is a misdemeanor punishable by fine from \$10 to \$250, and the same penalty will be visited on any person who obtains dispensary relief by false representations. The new law will not impede any of the regular dispensaries now in existence, but it will wipe out several hundreds which have been conducted for private gain. The new law was carefully considered by the medical and pharmaceutical societies and received their approval before being placed on final passage.

The State Board of Charities has framed rules for the government of the dispensaries. Hereafter no dispensary can obtain a license until it has satisfactorily answered a list of searching questions. It is recommended that at least two women be appointed on all boards of managers in institutions treating women and children, and that both visiting and assistant physicians and surgeons be appointed for a term of 3 years, with the object of attracting young and active practitioners into the service. The new rules adopted by the board provide for a registrar and for a matron, and insist that the sexes must be separated in waiting and treatment rooms. While all emergency and evidently needy cases are to receive immediate attention, it will be the duty of the registrar when in doubt as to the financial ability of the applicant to institute an inquiry, in large cities preferably through the charity organizations, and keep a record of the result. Applicants will be admitted only after signing the required declaration, and all pass-cards must contain the penal provision of the law—namely, that disobedience of the rules established is a misdemeanor, punishable by

a fine of not less than \$10 or more than \$250. No patient may be utilized for clinical demonstration without his consent. These rules have been put into practice, and some dispensaries have been obliged to take out new licenses under the law.

DISTRIBUTION. See ZOOLOGICAL LITERATURE (paragraph Special Treatises).

DISTRICT OF COLUMBIA. The District of Columbia and the city of Washington being co-extensive are here treated jointly.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise aggregated in value \$192,414, an increase in a year of \$14,517; exports, none.

Railroads.—The steam railroad mileage remained stationary during 1898, and the total direct construction in 1899 was 24.88 miles.

Banks.—On October 31, 1899, there were 12 national banks in operation and 7 in liquidation. The active capital aggregated \$3,027,000; circulation, \$1,211,881; deposits, \$19,971,363, and reserve, \$7,993,583. The loan and trust companies, June 30, 1899, numbered 3, and had capital, \$3,250,000; deposits, \$12,244,228, and resources, \$16,708,410. The exchanges at the United States Clearing-house in the year ending September 30, 1899, aggregated \$117,384,285, an increase of \$16,457,623 in a year.

Education.—At the close of the school year 1897-98, the school population was 72,420; enrolment in public schools, 44,698, and average daily attendance, 34,383. There were 1107 teachers, 117 buildings used for school-houses, and public school property valued at \$3,750,000. The revenue was \$1,251,655; expenditure the same, and teachers' salaries aggregated \$769,150. There were 5 public high schools, with 122 teachers and 2956 students; 19 private secondary schools, with 135 teachers, 838 secondary students, and 1238 elementary pupils; 2 public normal schools, with 15 teachers and 539 students, and 2 private ones, with 18 teachers and 61 students. Normal training was also given in two colleges. Six colleges and universities for men and for both sexes reported 3 fellowships, 169 scholarships, 413 professors and instructors, 2723 students, 138,700 volumes in the libraries, \$96,500 invested in scientific apparatus, \$4,377,500 in grounds and buildings, and \$1,279,075 in productive funds, \$392,610 in total income, and \$43,073 in benefactions. In 1899 the Monastery and College of the Holy Land, established by the Franciscan Friars of the Holy Land, and located near the Catholic University of America, was dedicated with more than usually imposing ceremonies on September 17; and on October 12 the new College of the Holy Cross, which forms a part of the Catholic University, was also dedicated.

Municipal Utilities.—Official reports show a total of 263 miles of streets, of which 191 miles are improved, 383 miles of sewers, and 360 miles of water-mains. The water system has cost \$9,000,000, and has a capacity of 346,400,000 gallons, and the average daily consumption is 50,000,000 gallons. Street cleaning costs about \$170,000 annually, and street lighting, by gas, \$166,000; by electricity, \$60,000. The police force of 565 men costs annually \$630,000, and the fire department, of 217 men, \$280,000.

Finances.—On July 1, 1899, the total funded debt was \$15,888,200, including stocks and bonds for \$3420, on which interest has ceased. The total assessed valuation for 1899 was \$196,587,846, an increase in a year of \$5,550,904. Estimates for the maintenance of the government during the fiscal year 1900-01, sent to Congress in December, 1899, called for an appropriation of \$7,657,773 for the District.

Population.—As estimated by federal officials the population on June 30, 1899, was about 300,000.

DODD, Moses W., a well-known retired publisher of New York City, died at his home there April 9, 1899. He was born in Bloomfield, N. J., November 11, 1813, and graduated from Princeton in 1837. He then entered the Princeton Theological Seminary, but ill-health compelled him to relinquish his studies, and in 1839 he formed a partnership with John S. Taylor, who at that time was one of the leading publishers of New York. The following year Mr. Taylor withdrew from the business, which was then carried on by Mr. Dodd. He published many works of a theological and religious nature. In 1870 he retired from the business, which has since been directed by his son, Mr. Frank H. Dodd, the firm name since 1876 having been Dodd, Mead and Company. For more than fifty years Mr. Dodd was the ruling elder of the University Place Presbyterian Church.

DOMESTIC ANIMALS. See ZOOLOGICAL SOCIETIES (paragraph American Association for the Advancement of Science).

DOMINICA, a possession of Great Britain, the largest of the Leeward Islands (*q. v.*), and constituting a presidency of that colony, has an area of 291 square miles and a population (1891) of 26,841. A large part of the inhabitants speak a French patois. The capital is Roseau (population about 4500), and the second town in importance is St. Joseph. The government is directed by a council of 6 official and 6 non-official members, nominated by the governor of the colony. The public

debt in 1899 was £70,900. Other statistics of finance and statistics of commerce have been:

	Revenue.	Expenditure.	Imports.	Exports.
1896.....	£24,905	£25,189	£64,477	£51,438
1897.....	23,610	24,061	54,074	47,416
1898.....	24,569	24,648	31,340	63,912

The aggregate entrances and clearances in foreign shipping in 1897 was 407,460 tons.

DOMINICAN REPUBLIC. See SAN DOMINGO.

DOW, LORENZO, born in Paris, Me., in 1825, died October 12, 1899. Mr. Dow was best known on account of his inventions. At the time of his death he was active president of the Dow Composing Machine Company, of New York City. During the war he invented a water-proof cartridge, which was sold by the millions to the federal government. During the last fifteen years of his life he devoted his attention to the improvement of typesetting machinery, the most successful of his inventions in this line being his composing machine. Mr. Dow graduated in 1848 from Wesleyan University, and went soon afterward to the Pacific coast, where he became identified with the early history of Virginia City and a number of other mining towns. He later became mayor of Topeka, Kan. After the Civil War Mr. Dow spent several years in South America, where he acquired interests in gold mines and hard lumber forests. He returned to this country to become identified with the development of silver mining and with the railroad and irrigation systems of Colorado.

DRAINAGE. See MINING ENGINEERING (paragraph Drainage).

DRAMA IN 1899. *American and English.*—Several new American plays of importance were produced during the year. *The Rev. Griffith Davenport*, by James A. Herne, which had only twenty-eight representations, is the most distinctive and original of these. It is a drama of the Civil War, rich in the delineation of character, negro and other. The principal figure, the preacher Davenport, is a Northern sympathizer living in the South. His patriotism, dislike of slavery, and sense of duty lead him to express opinions contrary to those of his family and neighbors. He is forced to go North, and is asked by the Federals to guide their army into Virginia, his former home. His wife, who has followed him North, protests, but after an impressive scene of hesitation he answers the call of his country, and she goes back to her people in the South. The play is another striking example of the author's refinement and simplicity of feeling, and independence and yet skill in theatrical construction. Like many of the original plays of the year, the *Rev. Griffith Davenport* is adapted from a novel, *An Unofficial Patriot*, by Helen H. Gardener. Produced at the end of 1898, but having its first New York representation in January, 1899, *Nathan Hale*, by Clyde Fitch, is based on a well-known incident in American history. Nathan is a schoolmaster and afterward a spy in the patriot army. He is taken prisoner and identified by his emotion on being brought face to face with the girl he loves. When confronted with his immediate execution he says the historic words: "I only regret that I have but one life to give to my country." It is a dramatic, simple, almost bare presentation of a strong situation. The method contrasts strikingly with the more detailed and unconventional one employed in the *Rev. Griffith Davenport*. Based on American history also is Clyde Fitch's *Barbara Frietchie*, which has, however, nothing essentially to do with the name. Like many of Fitch's plays, it is a mixture of romance, melodrama, and elements more nearly approaching tragedy. Barbara, a young Southern girl, loves a Union soldier, and uses a musket to save him from a rebel sharpshooter. But her lover, wounded, is brought into her house, where he dies. She takes the Union flag, which he has worn next his heart, and stands on a balcony in sight of the rebels. Stonewall Jackson makes his famous remark, adapted to the necessities of the play, a jealous lover shoots and Barbara dies. Conveniently mentioned here, though of little dramatic importance, is *The Cowboy and the Lady*, also by Clyde Fitch. This play deals ostensibly with Western ranch life, but is almost a burlesque, partly unreal comedy and partly exaggerated melodrama. An interesting play from many points of view is *Becky Sharp*, adapted from Thackeray's *Vanity Fair*. It was written by Langdon Mitchell, a young American dramatist, with a view to presenting the character of Becky, a character which Mrs. Fiske has so completely made her own that the play has, although a genuine, yet partly an ephemeral interest. In spite of the opposition to Mrs. Fiske of the theatrical syndicate, *Becky Sharp* was one of the great successes of the season. *Peter Stuyvesant, Governor of New Amsterdam*, by Brander Matthews and Bronson Howard, was an unsuccessful attempt by American dramatists to draw on the increasingly interesting material of American history. *Little Italy*, a one-act play, by Horace B. Fry, presented by Mrs. Fiske, has for a setting the poor Italian quarter

of New York, and in its simplicity of passion recalls *Cavalleria Rusticana*. *Sherlock Holmes*, founded on Conan Doyle's book, by William Gillette, is the cleverest of melodramas. In spite of the perfect technical construction of *Sherlock Holmes*, most of its interest is due to the acting and personality of Mr. Gillette in the title rôle. The play is a fine example of his individuality and skill as a playwright, often shown before in war drama and farce. David Belasco, the author of some well-constructed melodramas, turned his hand this year to farce in *Naughty Anthony*. It deserves mention merely as a rare case of a logically built farce, but like the ordinary farce, of which untold numbers are produced every year, it has no intrinsic interest. *Ben-Hur*, based on Lew Wallace's novel, and arranged for the stage by William Young, is a fine example of the great spectacles which have grown so rapidly of late in popularity and mechanical splendor. The play has no connection, of course, with permanent drama, but its combination of picturesque costumes, piquant and gorgeous ballets, and marvellous scenery is most noteworthy. Of the important English plays of the year many have been produced also in America. To begin with these: *Miss Hobbs*, by Jerome K. Jerome, is a light comedy satire of the "new" woman, whom the "old" man vanquishes in the time-honored fashion. It proved very popular with society audiences. *The Tyranny of Tears*, by Haddon Chambers, was one of the best comedies of the year. Its theme is simple and typical: marriage infelicities of a gentle but insistent kind. A young husband is interrupted in his work by the necessity of amusing his wife; his bachelor friends give him up after his marriage; his useful secretary rouses the wife's jealousy, and she employs all her art of tears to get the girl dismissed. The husband, urged by his last remaining friend, makes a stand, however, and the wife runs away to her father's house. The single night that she is away, the husband and his old friend sit up late, talking and drinking. In the morning they try to restore their physical comfort by the bachelor device of champagne at breakfast, the play here pointing to the ludicrous insufficiencies of bachelorhood. The dialogue throughout shows genuine humor, the comedy is easy and sure, based upon a mature treatment of life. In this respect it differs strikingly from R. C. Carton's *Wheels Within Wheels*, which belongs to the drama of epigram directed mainly against marriage. The situation is the conventional one of a good-natured but disillusioned woman compromising herself for the sake of a married friend, but all the characters talk glittering unrealities—the sort of thing which is best done in English in the plays of Oscar Wilde and George Bernard Shaw. *The Degenerates*, by Sydney Grundy, has a plot somewhat similar to that of *Wheels Within Wheels*. In this play, however, there is no attempt to be smart. The characters are decayed members of English society without energy enough for epigram, and the play, as an unimpassioned transcript of some dead aspects of that society, has a kind of realism. Mrs. Langtry plays a part which has a striking resemblance to some of the incidents of her own life. Contrasting with these plays are adaptations of romantic novels by the author of *The Degenerates*. Sydney Grundy's *The Black Tulip* and *The Musketeers* are dramatizations of the novels of Alexandre Dumas. Another play based on Dumas's *Les Trois Mousquetaires*, is Henry Hamilton's *The King's Musketeer*, produced by the Sothorns. The material of Dumas's novels is so dramatic that little but transcription is necessary to get some kind of theatrical effectiveness, and all these plays were consequently popular. On account of the special conditions under which Israel Zangwill's play was produced, *Children of the Ghetto* was a comparative failure, although it deserved success. It is a picture of Ghetto life and characters, with fine wit and poetry in the dialogue, of quite unusual literary merit. It is so faithful to the types of the Ghetto Jew that publications representing the well-to-do Jewish community protested against the play as a humiliating exposé, while the journals of the Ghetto also found the play realistic, but the life portrayed interesting and even beautiful. *Robespierre*, although a French play, was written for Sir Henry Irving by Victorien Sardou, translated by Lawrence Irving, and produced in London. The tyrant of the Revolution unwittingly condemns his own son to death, afterward tries to save him, is overthrown by the committee of citizens, and dies by his own hand. There are some dramatic scenes, but the points of the play are spectacular—the aristocrats awaiting the guillotine, the fête of the Supreme Being, in which Robespierre addresses the blood-drunken worshippers and is accused by his son, the scene where Robespierre and Clarisse watch the tumbrils as they pass for their son's body, Robespierre confronting the ghosts of his victims, and the meeting of the committee. Henry Arthur Jones's latest play, *Carnac Sahib*, a military melodrama, was a failure. *Osborn and Ursyne*, by "John Oliver Hobbes," a tragedy in verse, had literary charm and fineness. *The Only Way*, a dramatization of Dickens's *Tale of Two Cities*, by Freeman Wells, was one of the big melodramatic successes of the year. *Grierson's Way*, by H. V. Esmond, portrays, in a vein somewhat like Ibsen's, a character at once fine and weak. *A Royal Family*, by Captain H. Marshall, is a pretty and fanciful light comedy. In *The Gay Lord Ques*, by Arthur W. Pinero,

there is the intellectual grace and comedy of his two preceding plays, *The Princess and the Butterfly* and *Trelawny of the Wells*, without their looseness of construction, and the effective building of *The Second Mrs. Tanqueray* without the "problem" element. As in *The Profligate*, a man with a past is betrothed to a young girl, but the subject, instead of being treated seriously, is shown in a comic light.

Drama in France.—Farce and analytic drama of society have been preponderant in the year's production. *Georgette Lemeunier*, by Maurice Donnay, which plays about the conventional French situation, was a success largely because of its essentially modern and Parisian spirit, interpreted by that characteristically French artist, Mme. Réjane. *Le Torrent*, also by Donnay, is clever, too, but sombre. The plot would indicate a didactic purpose, although the purpose is not clear. An unfaithful wife, about to give birth to her lover's child, is advised by a friend to run away with the lover and throw down the gauntlet to society. A priest counsels her against it. She finally tells her husband, who drives her from the house, and in despair she throws herself into the river. *Le Berceau*, by Eugene Brieux, is a protest against divorce when there are children. A woman divorces her unfaithful husband and marries again. The presence of the child in the new ménage is a source of irritation and unhappiness. When the child is sick the first husband, the father, comes, and over the cradle the parents feel they might still have been together, while the new husband sees the force of the bond. *Le Vieux Marcheur*, by Henri Lavedan, portrays an old rake and the companions with whom he surrounds himself. *Plus Que Reine*, by Emile Bergerat, was fairly successful in Paris, where Coquelin played the part of Napoleon. It is described by French critics as merely a series of tableaux. When Julia Arthur produced it in New York it was a flat failure. *La Conscience de l'Enfant*, by Gaston Devore, is a "problem" play. A conscientious father wants his daughter to divorce her unfaithful husband. But the wife and her young daughter take the husband's side against the old man, the wife from passion, the child from a sense of duty. *La Nouvelle Idole*, by M. de Curel, is a philosophical drama which was played at Antoine's *Theatre Libre*, and enthusiastically praised by the critics. The problem is: Can a scientist sacrifice several lives in order to save thousands? A physician experiments with cancer virus on dying people in the hospital, among others a girl supposed to be dying of consumption. She recovers from consumption, but succumbs to cancer. The wife of the physician calls him an assassin; he decides to kill himself. But first, in the interest of science, he inoculates himself with the virus, after which he discusses the moral of the question with a physiologist. *Les Truands*, by Jean Richepin, is a romantic historical play somewhat in Corneille's manner, its motive a struggle between passion and duty. A very successful light comedy was *Ma Bru*, by Fabrice Carré and Paul Bilhaud, dealing with the ever-present mother-in-law. A successful farce was *La Dame de Chez Maxim*, which was also successfully produced in the United States. A complicated literary failure by an eminent man was *Le Lys Rouge*, by Anatole France.

Drama in Germany.—The year in Germany has produced little important drama. There has been nothing from Germany's great dramatist, Gerhart Hauptmann, since *Führmann Henschel*. Hermann Sudermann has produced one play during the year, *Die Drei Reihferdern*, which, interesting as literature, did not succeed on the stage. This play, which is intensely symbolic, marks in Sudermann's work a growing tendency away from his earlier naturalism. The idealism of *Moriturus* and *John the Baptist* is accentuated in *Die Drei Reihferdern*. The drama shows that in striving for the idealistic unreal, one may miss the idealistic real. Prince Witte, longing always for the invisible queen promised him by the "burial woman," ignores the real woman at his side until it is too late, and she is dying because he burned the last heron's feather to satisfy his burning longings, although he knew that when he did it his ideal must die. *Herostrot*, by Ludwig Fulda, is a tragedy in five acts. A fatherless boy is brought up by his blind mother to long for fame, but he has no power to do great things, and seized by nihilistic mania, burns the altar in his native city. The play was not very successful, not being in Fulda's real field, which has been described as "the world in which one chats." More in his familiar style is *Schlaffenland*, a fairy tale of the land where good living is the main thing, and *Die Zeche* (one act). Of almost the value of an original work is Fulda's beautiful translation of *Cyrano de Bergerac*. Max Halbe, who since he wrote *Die Jugend*, has produced several failures, appeared with *Die Heimatlosen*. It portrays the various characters in a Berlin family pension kept by a Frenchwoman. A twenty-year-old girl runs away from her mother because she must marry a bore if she remains at home. She believes, too, in her artistic future, but she finds she has not much talent and less energy. She admires a man with no soul, but with energy, and is seduced and deserted by him. She jumps out of the window just as her mother comes to take her home. *Der Probekandidat*, by Max Dreyer, is a skillfully constructed play representing the conflict between the desire for freedom of

conscience and the feeling for authority. The idealism of religious liberty, as in Schiller, and in early-century plays like *Uriel Acosta*, is here suggested. *Hans*, by the same author, is a genuine comedy, supposed to be in Dreyer's best vein. "Il est grand dans son genre, mais son genre n'est pas grand" has been applied to characterize Dreyer's quality. A professor lives with his daughter on an island in the North Sea. A girl with a past comes into their life. The professor and the newcomer fall in love with each other. The professor, to whom her past matters not, will marry her, but she refuses until the professor's daughter also asks her to join the family. *Die Grossmamma* is a very successful new play of Dreyer's. *Der Goldene Käfig*, by Felix Philippi, is the story of a prince who wants to get out of his golden cage in order to do something in the world. But the idea is not sustained to the end, the play developing along the lines of a conventional love-story. Successful with people and critics were Arthur Schnitzler's three one-act plays, *Paracelsus* (in the style of Hans Sachs), *Der Gefährte* (a play on marriage), and particularly *Der Grüne Kacader*, a scene during the French Revolution in a low tavern, in which revel actors, actresses and aristocrats. This play attracted the attention of the censor. *Pauline* and *Agnes Jordan* are two serious plays by Georg Hirschfeld. *Kain*, by a young playwright, Ernst Pranger, is a modern study of insanity handled with psychological depth. *Neigung* is a "problem" play by J. J. David. After thirty years of married life, love is destroyed between husband and wife through the daily grind of poverty. Nevertheless the daughter marries a poor man, in spite of her mother's warning. *Die Liebesheirat*, by Frau A. Baumberg, is a play based on the effect of the cares of life on married happiness. See GERMAN LITERATURE.

Henrik Ibsen's new play, produced in December at Copenhagen, *When We Who Are Dead Awake*, is one of the most symbolistic of the master's works. A sculptor is inspired by a beautiful woman, who loves him, to do a great work of art. He lives for his art and rejects the woman, who becomes a woman of the world. He marries unsympathetically. Years afterward he meets the model again, and realizes that he has lost his chance for happiness by seeking the ideal of art. She scorns the great work of art with which she inspired him. It is real children she longed for. Recognizing their mistake, they die together.

DRAWERIDGE. See BRIDGES.

DREDGES. Dredging machines or dredges, for excavating rock or earth under water, are of various forms, the most common of which are the clam-shell dredge, the dipper dredge, the continuous bucket chain dredge, and the suction dredge. The dipper dredge is especially adapted for excavating very hard material like hard-pan or blasted rock. The clam-shell and bucket dredges work best in moderately soft, tenacious material, like clay, and the suction dredge is especially efficient for excavating sand, silt, and similar soft materials.

During the year there has been at work on the Buffalo (N. Y.) breakwater construction a clam-shell dredge having a bucket capacity of 10 cubic yards. This machine is taking material from a depth of from 60 to 70 feet below the surface of the water at the rate, when operated at its full capacity, of 4000 cubic yards per day. As indicating to some extent the size of this dredge, it may be noted that the clam-shell bucket weighs, empty, 15 tons, and will hold full a load of 40 tons of clay, and the machinery is of such power that it will handle one bucket-load per minute in 65 feet of water. Two large suction dredges were begun during the year, to be employed on the New York harbor improvements. (See HARBOR IMPROVEMENTS.) These dredges will have steel hulls, and each will have sufficient force to pump sand through tubes at the rate of 40,000 tons an hour. The hoppers of each dredge are to have a capacity of 3000 tons of wet sand. The measurements of these dredges are: length, 320 feet; beam, 47 ft. 10 in.; depth, 20 ft. 6 in., and draft, loaded, 16 ft. 4 in. For pumping the sand each dredge will have two centrifugal pumps with 16 inches suction and delivery pipes, each pump being worked by a triple-expansion engine. During the year a chain-bucket dredge of large dimensions was built for the Karachi Port works in India. This dredge is 236 feet long, 42½ feet beam, 16 feet depth of hold, and 1250-ton hopper capacity. Another notable European chain-bucket dredge was put in operation during the year in Vladivostock harbor, Siberia. This dredge is 162 feet long, 33 feet wide, and 12½ feet draught. The hull is of steel. Actual tests showed this dredge to have a capacity of 457 cubic yards excavation per hour in compact clay. A suction dredge built for use on the river Volga in Russia is constructed in two parts, which can be operated as separate dredges or combined into one large dredge. Each part of this dredge has the following dimensions: length, 216 feet; width, 33½ feet; depth, 9 feet, and draught 4 ft. 8 in. A notable feature of this dredge is that it is propelled by electric power. In America the largest dipper dredge ever built was put in operation during the year on the Great Lakes. The hull dimensions of this dredge are: length, 132 feet; beam,

42¼ feet; depth, 13½ feet. The dipper capacity is 8¼ cubic yards, and the dipper weighs 16 tons. The guaranteed capacity of this dredge is from 5000 to 6000 cubic yards per ten-hour day.

DREYFUS, ALFRED. See FRANCE (paragraphs on History).

DROZ, NUMA, a former president of the Swiss confederation, and a distinguished statesman of Switzerland, died December 15, 1899, at the age of 55 years. M. Droz was born in the canton of Neuchâtel. His political career began in 1869, when he became a member of the Grand Council. He directed successively the various departments of public instruction, the interior, agriculture and commerce, and foreign affairs, and was finally chosen president of the Federal Council. He secured the enactment of the Swiss law regulating the protection of literary property, and he was one of the negotiators of the Franco-Swiss commercial treaty, concluded in 1882. He was not directly elected to the presidency of Switzerland, his occupancy of that office having come about through the death, by suicide, of President-elect Auterwert, with whom he had run as vice-president. The death of M. Auterwert occurred a few days before the appointed inauguration day.

DRY DOCKS. The most notable incident of 1899 in this line of civil engineering was probably the decision of the United States government to add four docks of the largest size to its navy yard facilities at Boston, Mass., Portsmouth, N. H., League Island, Penn., and Mare Island, Cal. Described without technicalities, a dry dock or graving dock is a masonry or timber-lined basin connecting with the harbor waters, and having approximately the form of a ship's hull, into which a vessel can be floated, and which can then be closed and emptied so as to leave the bottom of the vessel dry and available for cleaning and repairs. In Europe it is the almost universal practice to line these basins with stone or concrete masonry, but in America a timber lining has been adopted more extensively than masonry. Two of the new docks to be built by the United States—those at Boston, Mass., and Portsmouth, N. H.—will be masonry, and the other two will be timber docks. The accompanying figures show the principal dimensions of some of the leading foreign and American dry docks:

London-Blackwall, 471x65x23 feet; Tilbury, 846x70x35 feet (can be divided); Liverpool, New Canada Graving Dock, 925x94 feet, and 565x70x22.4 feet, and 768x60x22.10 feet; Birkenhead, 750x85x20.7 feet; Belfast, 800x80x25.8 feet; Glasgow, 880x83x26.6 feet; Southampton, 660x91x32.6 feet; Plymouth, 464x80x22 feet; Hull, 550x65x21.6 feet; Leith, 410x70x21 feet; Barrow, 500x60x22 feet; Newcastle, 550x80x26.8 feet; Cardiff, 618x62x27 feet; Newport, 520x65x32 feet; Barry, two docks, 747x60x28 feet (divided), and 610x65x29 feet, in construction; Antwerp, 459x81x23 feet; Bordeaux, 540x72x27 feet; Dunkirk, 622x68x26 feet; Genoa, 622x68x26 feet; Bremerhaven, 700x80x31 feet; Sydney, 640x66x20 feet, and 608x84x32 feet; Buenos Ayres, 587x65x26 feet; Chili, 617x87x30 feet; Portsmouth, N. H., 350x90x25 feet; Boston, Mass., 367½x60x25.8 feet; New York, N. Y., 459.8x85x25½ feet, and 338¼x66x25¼ feet, and 626¼x105¼x29 feet; League Island, Penn., 459.8x85x25½ feet; Norfolk, Va., 302¼x60x25 feet, and 459¼x85x25½ feet; Port Royal, S. C., 459x97x26 feet; Mare Island, Cal., 459x80½x27½ feet; Puget Sound, Wash., 618½x92.6x30 feet. Of the eleven American docks last named three only are built of masonry.

Compared with these existing dry docks, the new American docks present the following principal dimensions:

	Timber Docks.		Masonry Docks.	
	<i>Ft.</i>	<i>Ins.</i>	<i>Ft.</i>	<i>Ins.</i>
Length on coping.....	750	..	750	..
" floor.....	725	..	725	..
Width on coping in body.....	180	..	144	6
" " at abutment.....	101	8	101	9
Width on floor in body.....	80	..	80	..
" at entrance.....	101	..	100	..
Depth, coping to floor.....	89	8	89	8

It will be seen from the figures that while a number of foreign dry docks now built exceed in size the new United States docks, yet the latter average up well in size with foreign docks as a whole, and they exceed greatly in size any of the dry docks now in operation at American navy yards. Perhaps the most notable feature in connection with the new American docks, aside from their size, is that two of them will be constructed of masonry. At the present time a timber dock can be built for about 25 per cent. less money than a masonry dock, but engineers are quite

unanimous in the opinion that this greater cost of masonry docks is compensated for by their lower cost for repairs and their far greater durability, strength, and safety. Only one of the new timber docks has been contracted for, and the contract contains the provision that its construction may be changed to masonry should the government desire. The Bureau of Yards and Docks of the Navy Department strongly urges that all four docks shall be built of masonry, and it is quite possible that Congress may be influenced to appropriate the extra money to enable this superior construction to be adopted in place of the two timber docks now planned for.

In addition to the four new dry docks mentioned above, the United States has under construction a floating dry dock, which is claimed to be the largest ever constructed. In form a floating dry dock is practically a rectangular box of steel construction mounted on steel pontoons. One end of this box is provided with an entrance which permits a vessel to be floated into it. To sink the box below the water surface so that vessels may enter it, the pontoons are partly or wholly filled with water. After the vessel is inside and securely blocked up, the water is pumped out of the pontoons, and their buoyancy lifts the box out of the water, leaving the vessel's hull dry. A reversal of these operations sinks the pontoons and box below the water surface and enables the vessel to be floated out again. The new government floating dock is 525 feet long, 52 feet high, and 100 feet wide, and has a lifting capacity of 15,000 tons. It is now being built at the yards of the Maryland Steel Company, at Sparrows Point, Md., and, when completed, it will be towed to its location at Algiers, La. When empty and being towed the dock has a draught of 4 feet of water.

DUGGAN, Bishop JAMES, of the Roman Catholic Church, died March 27, 1899, at St. Louis. Bishop Duggan had been a patient for nearly thirty years in a sanitarium, but before that he had been a prominent officer of the church. Fifty years ago he was the associate and friend of Archbishop Kenrick, who had looked upon him, it is said, as his successor. He was born in Ireland in 1825, and came to the United States when young. After many years of service of various ranks, at St. Louis, he became in 1857 coadjutor archbishop, with the title of Bishop of Antigone, and was nominated soon afterward as Bishop of Chicago.

DUNKARDS (otherwise known as Tunkers or German Baptists), a denomination of Christians, comprise: (1) the German Baptists (Conservatives), with 2480 ministers, 820 churches, and 90,000 church members; (2) the German Baptists (Old Order), with 150 ministers, 100 churches, and 3500 members; (3) the German Baptists (Progressive), with 231 ministers, 160 churches, and 15,000 church members, and (4) the Seventh-Day Baptists (German), with 5 ministers, 6 churches, and 194 communicants. The entire Dunkard denomination includes (1899) 2866 ministers, 1086 churches, and 108,694 church members. The headquarters of the missionary and publishing activities are at Elgin, Ill. A national conference was held at Roanoke, Va., in May, and in the summer a congregation was organized for the first time in Montreal. The Progressive Brethren opened a college in Ashland, O. The next annual conference will be held at North Manchester, Ind., in June, 1900.

DUNNE, FINLEY PETER, was born in Chicago, July 10, 1867; he was educated at the public schools, and began his business career as a newspaper reporter in 1885; he was city editor of the *Chicago Times*, 1891-92, and on the editorial staff of the *Chicago Evening Post* and *Times-Herald*, 1892-97. His two books, *Mr. Dooley in Peace and in War* (1898), and *Mr. Dooley in the Hearts of His Countrymen* (1899), have been received with great favor, not only in this country, but in England, where he spent the summer of 1899.

DURAN, ÉMILE AUGUSTE CAROLUS, French painter, born in Lille in 1858, studied under Souhon, at the academy in Lille, and in Paris, and, gaining a scholarship, went to Italy. He has also lived in Spain. In 1899 he succeeded Puvis de Chavannes as president of the New Salon. His works include "La Prière du Soir," "L'Assassine," "St. Francis of Assisi," "The Lady with the Glove," and many portraits. Mr. Carolus-Duran visited the United States in 1898 and 1899. "Christ Upon the Cross" was much admired at the Salon of 1899.

DUTCH EAST INDIES, classified as territory directly under the government of the Netherlands, as vassal lands, and as confederated lands, comprise Java and Madura, almost all of Borneo, Sumatra, part of New Guinea, the Riau-Liugga archipelago, Celebes, Billiton, Banca, the Molucca archipelago, and the small Sunda islands. The total estimated area is 736,400 square miles, and at the close of 1897 the population, though not definitely determined, was placed at 34,090,000. The figures for several of the divisions were as follows: Java and Madura, 50,554 square miles—population, 25,697,701; Sumatra, 161,612 square miles—population, 3,209,037; Celebes, 71,470 square miles—population, 1,997,860; Borneo, 212,737 square miles—

population, 1,180,578; Lambok and Bali, 4065 square miles—population, 1,044,757; Riau-Liugga islands, 16,301 square miles—population, 107,861; Molucca islands, 43,864 square miles—population, 399,208. In 1896 the persons of European blood numbered 67,156, of whom five-sixths were Dutch. The religion of the natives is for the most part Mohammedan.

The administrative and executive authority of the Dutch East Indies is vested in a governor-general, assisted by a council of five members. Since July, 1893, the governor-general has been C. H. A. van der Wyck. There are many districts in the interior of Borneo, Sumatra, Celebes, and other islands in which the Dutch sovereignty is merely nominal, and some of the smaller islands are administered by their own princes, who, however, are subject to the directions of a Dutch Resident. In the islands there is a colonial army of 1359 officers and 41,750 men. The local revenues are made up chiefly from taxes, monopolies, and customs duties; the principal items of expenditure are army, navy, and general administration. The revenue and expenditure for 1898 were 139,412,904 guilders and 154,519,438 guilders respectively. The budget estimates for 1899 were: Colonial revenue, 115,666,550 guilders; Holland revenue, 17,075,964 guilders—total, 146,085,944 guilders; colonial expenditure, 116,600,742 guilders; Holland expenditure, 29,485,202 guilders—total, 132,742,514 guilders. The value of the guilder in United States currency is \$0.402. The leading exports are sugar, rice, coffee, tea, indigo, tobacco, cinchona, and tin. The total imports and exports in guilders for 1895 were 161,530,294 and 225,087,810 respectively; for 1896, imports, 168,348,633; exports, 199,630,711. At the Dutch East Indian ports there entered in 1895, 3633 vessels, aggregating 1,508,040 tons; in 1896, 3905 vessels, aggregating 1,603,620 tons. All but a small proportion of this tonnage was carried in steamers. The total length of railway lines open for traffic in the islands at the close of 1896 was 1112 miles; there were 6699 telegraph lines and 109 stations. The number of post-offices is about 300.

DUTCH GUIANA, or SURINAM, a South American possession of the Netherlands, lies between the British and French Guianas, on the west and east respectively, and has the Atlantic Ocean on the north and Brazil on the south. The country consists of sixteen districts, the total area of which is 46,060 square miles, and the population at the beginning of 1897, exclusive of negroes living in the forests, was about 64,372. Paramaribo, with about 30,000 inhabitants, is the capital. The executive authority of Dutch Guiana is vested in a governor, who is assisted by a council comprising, besides himself, three members and the attorney-general; all are appointed by the crown. The representative body of the country, with the exception of four members appointed annually by the governor, is elective in the proportion of one representative for each 200 electors. There are three cantonal and two circuit courts, besides a superior court, all of whose members are nominated by the crown. Complete religious toleration prevails. At the beginning of 1897 religious sects had the following numbers: Moravian Brethren, 25,421; Roman Catholics, 11,773; Hindus, 9698; Reformed and Lutheran, 8974; Mohammedans, 2681; Jews, 1250. Besides a normal school and two schools controlled by the Moravian Brethren and the Roman Catholics, there have been reported (for 1896) 19 public schools, with 2283 pupils, and 35 private schools, with 4847 pupils. For defence and the maintenance of order there are a small militia, civic guard, garrison, a few guard-ships, and a small number of vessels of the Dutch navy. The chief sources of the local revenue are customs, excise duties, and taxes on real and personal property; there is necessary an annual subvention from the Netherlands government. Statistics of finance and trade in guilders are:

Local revenue.	Subvention.	Expenditure.	Imports.	Exports.
1896. ....	.....	.....	5,335,180	4,391,728
1897. 2,017,700	229,000	2,245,000	5,635,161	5,241,671
1898. 2,141,000	207,000	2,348,000	.....	.....

The value in United States currency of the guilder, or florin, is \$0.402. The chief products are cacao, sugar, bananas, coffee, maize, rice, rum, molasses, and gold. The output of gold in 1896 was 846,366 grammes. The arrivals at the ports in 1897 were 248 vessels of 107,153 tons and the clearances 253 vessels of 108,988 tons. Internal communication is effected largely by river navigation.

DWIGHT, TIMOTHY, who resigned the office of president of Yale University in 1899, was born in Norwich, Conn., November 16, 1828. After graduation at Yale in 1849, he studied theology and was tutor there until he went to Bonn and Berlin, where he studied in 1856-58. In the latter year he became professor of sacred literature and New Testament Greek at Yale Theological Seminary. He held this chair until 1886, when he became president of Yale University, which post he filled for thirteen years. Yale gave him the degrees of D.D. and LL.D.

EARTHQUAKES. The *Monthly Weather Review* gives the earthquakes for the first six months of 1899 as follows: Nicaragua, 2; Chile, 1; Haiti, 1; Cuba, 1; New Hampshire, 1; California, 9; New Mexico, 1; Washington, 1; Illinois, 2; Virginia, 2, one of which was quite violent; North Carolina, 1; Indiana, 1; Kentucky, 1; New York, 1. Several severe earthquakes occurred during the year. Thus, on the 6th of August a very hard one was felt at Messina, Italy. The city of Mexico on January 24 experienced the severest shock that it has ever felt, and the same one was noticed over the entire republic, and the day following a slight one was felt in California. Late in December a series of violent earthquake shocks occurred in the Caucasian region of Russia, affecting thirteen villages and completely destroying six, with a loss of life which was reported to reach 800. A paper by F. de Montessus de Ballore, on the earthquakes of Mexico and Spanish America, divides the latter region into six seismic centres, which in the order of their decreasing seismicity, together with the total number of recorded shocks, are as follows: Central America, 2659 shocks; Northern Andean region, 1385; Central Andes, 2884; Southern Andes, 2956; Atlantic coast of South America, 2956; Antilles, 157.

EAST AFRICA is the term applied to the British, German, and Portuguese possessions on the eastern coast of Africa, extending from Abyssinia on the north to the British colony of Natal on the south. See the articles **EAST AFRICA, BRITISH**; **EAST AFRICA, GERMAN**; and **EAST AFRICA, PORTUGUESE**.

EAST AFRICA, BRITISH, is an enormous territory, embracing over 1,000,000 square miles, and extending from Zanzibar, on the Indian Ocean, in a northwesterly direction, to the Upper Nile Valley. The Indian Ocean and Italian possessions bound it on the east, German East Africa lies to the south, French Congo and the Congo Free State bound it on the west, and on the north it touches the Egyptian Soudan. The entire territory includes three important divisions, known as (1) the **EAST AFRICA PROTECTORATE**, (2) the **UGANDA PROTECTORATE**, (3) the **ZANZIBAR PROTECTORATE**, which see for details upon these sections. British East African control is of recent date. German and Italian agreements with England in 1886, 1890, and 1891 defined the northern and southern boundaries. In 1886 the dominions of the Sultan of Zanzibar, which had formerly included the entire coast, were limited to a ten-mile strip from Cape Delgado to the Ozi River. In 1888 the Imperial British East Africa Company acquired jurisdiction over the coast from the Umba to Kifini. Control was later extended to the equatorial lakes in the interior, and in 1892 its sway extended as far as Lake Albert Edward and Uganda. The company was dissolved in 1895, and the three British protectorates mentioned were extended over its territories.

EAST AFRICA, GERMAN, with a coast line on the Indian Ocean of about 620 miles, and an area of about 380,000 square miles, lies between British East Africa on the north, British Central and Portuguese East Africa on the south, and British Central Africa and the Congo State on the west. It has a population of 4,000,000, including 1000 foreigners, of whom 700 are Germans. The region is administered by an imperial governor at the capital, Dar-es-Salaam. Bagamoyo, Saadani, Pangani, Kilwa, and Tanga are, with the capital, the principal coast cities. The products of the country are coffee, tobacco, cotton, corn, ivory, caoutchouc, gum, and copra. The imports, including cottons, ironware, rice, oil, and spirits, amounted at the latest date obtainable to about \$2,250,000; the exports, consisting principally of ivory, rubber, gums, corn, sesame, and copra, amounted to about \$1,000,000. Half the goods imported came from India and Great Britain, and about two-sevenths from Germany. The territory is naturally a productive one, and Germany has established several experiment stations and taken other steps toward developing its agricultural and trade possibilities. Among minerals there are coal, iron, and salt, and some gold. There are also valuable forests. A railway connects Tanga with Pongwe, an extension of which is being pushed toward Karagwe, a Central African state mainly under German influence. Especial attention was directed to German East Africa in 1899 by the visit of Mr. Cecil Rhodes to the German Emperor, for the purpose of negotiating for the right-of-way for telegraph and railway lines across the territory. Mr. Rhodes's special mission to Berlin was regarding the extension of the proposed "Cape to Cairo" Railway (*q. v.*) across German territory. During the past year the German government has made two important appropriations connected with the development of this possession. Early in March estimates were approved whereby the government will acquire, at a cost of 2,000,000 marks, the Usambara Railway, running from Tanga, and will complete its extension to Karagwe. An appropriation of 630,000 marks was made also for the construction of a floating dock at Dar-es-Salaam, which will be of great importance to Germany in Indian and Pacific waters.

EAST AFRICA, PORTUGUESE, fronts on the Indian Ocean, and lies, roughly, between German East Africa on the north and British South Africa on the south, being bounded on the west by British Central and British South Africa and the

Transvaal. Its area is 301,000 square miles, and its population something over 3,100,000, mostly natives. It is divided into the large districts of Mozambique and Lourenço Marques, and the smaller districts of Zambesia, Inhambane, and Gaza. The colony is administered by a royal commissioner, appointed for three years. Two important railroads extend westward from the coast, one from the port of Lourenço Marques to Pretoria and Johannesburg, in the gold and diamond regions of the Transvaal Republic, and one, farther north, from the port of Beira to the British territory known as Rhodesia. Through the influence of these railroads their Portuguese termini are becoming important ports of entry. The Zambesi River and Lake Nyassa also are becoming important highways of trade, especially for the transfer of ocean freight into the interior of the continent. Mozambique is developing an important trade with the continent and with the island of Madagascar. The value of the goods received at the various ports of Portuguese East Africa is reported as reaching the value of \$25,000,000 per annum. Two-thirds of this represents the transit trade intended chiefly for the mining regions of Johannesburg, Kimberley, and Rhodesia. The imports, 1897, at Mozambique, were £151,823, exports £160,571; at Lourenço Marques, £784,000 imports, £38,000 exports, £2,660,000 transit trade; Beira, £578,500 imports, £35,460 exports, £205,320 transit trade. The chief imports are clothing, food-stuffs, and liquors; the chief productions and exports are oil nuts and seeds, caoutchouc, and ivory. Machinery, bread-stuffs, clothing, and mining requisites make up the transit trade. The Manica and Sofala gold region is administered by the Mozambique Company; the Nyassa Company controls the region between the Rovuma, Lake Nyassa, and the Lurio, and the Zambesia and Mozambique sugar companies develop trade in other regions. Three steamship lines connect Lourenço Marques with New York. The exports to the United States, 1898, amounted to \$15,343, and the imports to \$2,897,657.

EAST AFRICA PROTECTORATE, a protectorate of British East Africa (*q. v.*), extends inland, from the Umba and the Juba, on the Indian Ocean, to the borders of the Uganda Protectorate. It has an estimated population of 2,500,000, including 13,500 Asiatics and about 400 Europeans. It is administered by a commissioner and consul-general, and is at present divided into four districts, the Coast Province, Ukamba, Tana-land, and Juba-land, under sub-commissioners. A large portion of the protectorate is still unorganized. Mombasa, the capital, has a fine, improved harbor, and has become an important trade centre. It is connected with the island of Zanzibar by cable and with the port of Lamu by telegraph. The construction of a railway, together with a telegraph line, was begun late in 1895 to connect Mombasa with Lake Victoria Nyanza, the distance being 670 miles. A report, made in July, 1899, shows good progress in the work thus far. Some 280 miles had been constructed up to March, 1899, at an expenditure of £1,945,281, or about \$9,465,737. The road was pushed some 80 miles farther by the close of November, 1899. Another piece of work, important to the capital and state, is the Macupa bridge, 1383 feet in length, connecting Mombasa, across an arm of the sea, with the mainland. This bridge, which was built within two years, was opened on July 8, 1899, and was named the Salisbury Bridge. The imports of this protectorate had a value in 1897-98 of 4,464,827 rupees, and included cotton cloths, provisions, brass, wire, beads, etc. The exports were 1,087,266 rupees, and consisted of ivory, rubber, cattle and goats, copra, gum-copal, and hides. The rupee was in 1899 equal to \$0.404 United States currency.

EASTWOOD, BENJAMIN, a well-known retired Episcopal clergyman, died in Pawtucket, R. I., January 26, 1899. He was born in Lancashire, England, July 4, 1825; prepared for the ministry at the Berkeley Divinity School and was ordained in 1846. For a time he was connected with the Wesleyan movement, but returned to the Episcopal Church, and coming to the United States was rector at Plymouth and Torrington, Conn. In 1873 he accepted a call to Pawtucket, where he was actively engaged as rector for twenty-five years. He wrote *Trials and Triumphs Among the Lowly and Cranberry Culture*.

EATON, DORMAN B., a lawyer of New York City, and for many years a prominent advocate of civil service reform, died December 23, 1899. He travelled abroad several times in pursuance of civil service studies, and was appointed by President Grant in 1873 a member of the first National Civil Service Commission. A fellow-member was George William Curtis. In 1877, at the request of President Hayes, Mr. Eaton again visited England. The result of that labor was a report upon the English service, published by order of Congress, which is considered the foundation of the present federal civil service system. Mr. Eaton later presented a report to Congress upon the New York post-office and custom house, comparing the results under the spoils system with those under the merit system, which was then beginning to be enforced in those offices. In drafting the Pendleton act, the first service measure toward federal service reform, he took a prominent part, and was a member of the first commission, under Presidents Arthur and Cleveland. In municipal

reform also he was active. In 1866 he drafted the law for creating a Metropolitan Board of Health, and the law establishing the police courts of New York City. At the joint solicitation of the Senate and House of Representatives in 1874-75, he prepared a code of laws for the District of Columbia. He was born at Hardwick, Vt., in 1823, and was graduated from the University of Vermont and the Harvard Law School. His law partner in New York City was the late George Kent, author of *Kent's Commentaries*. Among Mr. Eaton's works on political and municipal subjects are *The Independent Movement in New York*; *Civil Service in Great Britain*, and various magazine articles. He is the author also of a number of treatises on law. By his will Mr. Eaton gave \$100,000 each to Harvard and Columbia Universities for chairs in the science of government and in municipal government respectively.

ECONOMIC ASSOCIATION, AMERICAN, organized in 1885, has about 600 members; president, Arthur T. Hadley, president of Yale University; secretary, Professor Charles H. Hull, of Cornell University. It held its fourteenth annual meeting at Cornell University, December 27-29, 1899. President Hadley's address continued the same subject as he treated at the meeting in December, 1898. He then discussed "the relation of economics to politics," the general purport of his paper being that the economists should strive to regain the influence in practical political affairs which they had formerly possessed. The title of his paper at the 1899 meeting was *Economic Theory and Political Morality*, and it dealt with certain general criticisms that had been made on the position he took in his last annual address. These criticisms were based on the view that in modern society the individual is so completely a feature of his environment and of the class to which he belongs that the claim to a wider outlook—that is to say, to an understanding of the interests of society as a whole—is either pharisaical or hypocritical. President Hadley maintained that the economist should aim to disassociate himself from class interests and to consider the welfare of the whole community, and he did not think that such an aim was impossible of realization in spite of the great difficulty in the way. He characterized the doctrine that competition between classes made for progress as wholly false. Class antagonism was not the material out of which civilization was formed, but society advanced by means of competition within classes and not competition between classes. He pointed out that the benefit of competition did not accrue to the persons immediately interested, but to the whole community. The modern civilized community attempts to regulate the struggles for existence where such struggles are against the current standard of morality, and on this point he concluded that "the success of competition, so far from warranting us in the adoption of a system of political morality and the theory of political progress, based on advocacy of class interests, proves rather the advantage and even the necessity of subordinating those interests to a wider common good." Competition has broken down in the industrial world and can no longer be utilized with advantage. We are no longer willing to make such sacrifices for individualism as would be involved in the reduplication of enormously expensive plants. The competition of even twenty-five years ago would be disastrous in certain lines of manufacture. Thus, the industrial world has become to some extent a centralized system in which comparatively few are intrusted with the productive powers which were at one time scattered among many. Thus, the power both for good and evil on the part of controllers of industry has greatly enhanced, and we have those phenomena of monopoly which seem to call for legal restraint. There is no longer the same reliance placed in individual initiative to correct abuses of power, and we are trusting more and more to the interference of the public authority. There is a tendency to subordinate class interests to the general welfare, and the ideal of economists should be this wider sphere of work and thought. The same breakdown which he finds in competition he sees in the principle of representative government. The great fault of representative systems is that the member of the legislature does not represent the country as a whole, but is a mere spokesman for local interests. Hence, legislative action became a tissue of compromises without any bearing upon general political welfare. Unless there is a reaction this tendency is certain to produce bad results. The mere competition of political groups within a nation without consciousness of national ends cannot tend toward progress. Neither the statesman nor the economist can limit his views to class interests.

The discussions of the association have assumed a far more practical tone than formerly. In the meeting of 1898 the scope and methods of the census were discussed, and the criticisms upon the methods employed in previous censuses had very important results. Several of the authors of these critical papers were placed in charge of divisions in the census bureau, and it was evident in 1899 that the new census would be carried out, so far as possible, in accord with the principles which were embodied in these discussions. In the meeting at Ithaca practical questions of public policy held the leading place. The most important discussion was that on

trusts. Papers were read by Professors Ely, Emery, Durand, and Sherwood, and the practical side of the question was presented by Hon. C. S. Fairchild, formerly secretary of the treasury, and Mr. James B. Dill, who has been associated as counsel and director of some of the largest industrial corporations. As to the practical expedients, both Mr. Fairchild and Mr. Dill agreed that a great safeguard would be a well-prepared plan of publicity. It was argued that there was real danger involved in the excessive capitalization of trusts, and that the results were, in the first place, excessive fluctuations of securities and the element of speculation on account of inaccurate information; in the second place, the improper payment of dividends out of capital accounts; and in the third place, the creation of artificial capital by an arbitrary raising of the prices or by depreciation of wages. It was urged by Mr. Dill that these tendencies would be injurious to all the corporations and to the country at large. He proposed that provision should be made by legislation for voluntary incorporation and for publicity. As a result of this he maintained that the honest company would at once incorporate under this act, while those which had something to conceal would not seek incorporation and the consequent publicity. As to what this publicity should consist in Mr. Dill proposed that it should be limited to such matters as the public had a right to know—that is, that it should be reasonable, and that it must also apply to all corporations similarly situated. It should be given only to stockholders, but when it was once distributed among them it would be easily accessible to the outside world. Against this view it was urged that attempts in the past to secure publicity had failed. Other points brought out in the discussion were the enhanced demand for managing ability in connection with the growth of trusts and the suggestion was made that it was not capital which limited the development of industry in our day, but that it was the scarcity of this organizing talent. Again, the crushing out of the small competitor, with its injury to a spirit of independence and personal initiative, was emphasized. For a further discussion of this topic see the article TRUSTS.

An important feature of the meeting was the preliminary report of the Committee of Colonies. This was appointed in the meeting of December, 1898, for the purpose of obtaining information in regard to the fiscal methods and economic conditions of typical modern colonies with the object of using it as a basis for suggestions as to the principles which might apply to the government of the new dependencies of the United States. As a result of a preliminary study of the colonies of the different countries the committee reported the following general suggestions:

First. The finances of each colony should be managed exclusively for the sake of the colony and for its development, and not for the advantage of the mother country.

Second. No uniform system of detailed fiscal management for a number of colonies in different parts of the world can be established. Each colony must be considered by itself and its system must be adapted to its conditions.

Third. Each colony should, as far as possible, be made self-supporting; but the mother country may well sustain the colony's credit or make advances to be repaid at a later date.

Fourth. In undeveloped colonies whose inhabitants are not capable of managing important public works, such as railways, canals, telegraph systems, etc., these improvements may well be owned by the government and managed by government officials rather than by private companies.

Fifth. The selection of sources of revenue must in each case be determined in accordance with the economic and social conditions of the colony.

Sixth. Where the colony is so situated that the development of trade with foreign countries is the chief economic consideration, import duties should be very low or practically non-existent.

Seventh. In colonies of undeveloped economic resources the chief reliance for general government income should be on a system of internal revenue taxes. Excise duties should be levied primarily on a few articles of general consumption, like alcoholic drinks, opium, and rice. When any colony has decided advantages in the production of some specially favored commodities, like sugar, tobacco, hemp, etc., it may be desirable to impose business licenses or similar duties on them. It is even a question whether low export duties on such commodities may not advantageously be employed in exceptional cases.

Eighth. It is undesirable to utilize an octroi or a system of taxes on consumption for local purposes. Local revenue should, in most cases, be derived in a large measure from real estate, business licenses and kindred specific taxes.

Ninth. In the administration of fiscal affairs natives, wherever possible, should be utilized as officials. It should be fully understood, however, that in the last resort the desires of the United States government, expressed by the proper authority, are to be paramount and its decisions final.

Tenth. As long as any of the colonies have not attained modern industrial con-

ditions, it may be advisable to continue as far as may be possible native customs during the period of transition. For example:

It is quite possible that for some time to come the system of farming out the revenue to contractors, especially to native chiefs, should be retained.

Eleventh. For the proper administration of the fiscal system in any of the dependencies of the United States it is absolutely essential to establish a civil service, which is beyond question, as respects the ability and honesty of its personnel.

Twelfth. In those dependencies where it is difficult to secure an adequate supply of efficient native labor, the question of the admission of foreign laborers should be seriously considered. While there may be sufficient justification for the exclusion of Chinese workmen from the United States, it by no means follows that they should be excluded from the Philippines.

ECONOMICS, HOSPITAL. See NURSES, TRAINED.

ECUADOR, an equatorial republic of South America, is bounded on the north and east by Colombia, on the south by Peru, and on the west by the Pacific Ocean. The capital is Quito.

Area and Population.—The country, comprising sixteen provinces and one territory, has an area of about 120,000 square miles, and a population, according to the last official estimate, of 1,271,861; of these about 100,000 are whites (Spanish descent), 300,000 mestizos, and 870,000 Indians. Ecuador has unsettled boundary disputes with both Peru and Colombia; the controversy with the latter country concerns the region on the left bank of the Napo River. The most populous provinces are Pichincha (205,000) and Azuay (132,400), and the least populous are Esmeraldas (14,558) and Oro (32,600). The principal cities, with their estimated populations, are: Quito, 80,000; Guayaquil, 50,000; Cuenca, 25,000; Riobamba, 12,000; Loja, Ambato, and Latacunga, each about 10,000.

Government.—The constitution, dating from 1884 and modified in 1887 and 1896, vests the chief executive authority in a president, who is elected by a popular vote for a term of four years and is assisted by a cabinet of five members, responsible with himself to the congress. The president, cabinet, and seven others constitute a council of state; the chairman of this council is the vice-president, who is elected for four years in the same manner as the president, but two years later than the latter, so that he holds office during parts of two administrations. The president is Señor Eloy Alfaro; his yearly salary is 12,000 sucres. The legislative power is vested in a congress of two houses, the senate and the house of deputies. Senators are chosen by direct vote for terms of four years, there being two senators from each province and one-half of the entire number retiring every two years; deputies are elected in the same manner for terms of two years, the number being based on the proportion of one deputy for every 30,000 inhabitants. The congress convenes annually on the 10th of June. Legal electors must be Roman Catholics, able to read and write. Provincial administration is directed by governors appointed by the federal government. The Galapagos Islands, owned by Ecuador, are administered territorially. Besides inferior courts, which try both civil and criminal cases, there are courts of appeal, comprising six superior courts at different places, and the Supreme Court at Quito. Consular courts are established at Quito, Guayaquil, and Cuenca.

Army and Navy.—The regular army, comprising infantry, cavalry, and artillery, numbers 3341 officers and men, and the national militia is reported to number about 30,000 men. The so-called navy amounts practically to nothing, consisting of a torpedo launch and a transport, the complement being about 130 men.

Finance.—The revenue is derived chiefly from customs duties, about 70 per cent. being attributed to this source; other items of revenue are taxes on cacao, white rum, real estate, and tobacco, and monopolies on salt and gunpowder. The estimated revenue for both 1897 and 1898 was 9,093,551 sucres, and the estimated expenditure 11,005,141 sucres.

The foreign national bonded debt amounts to about \$3,372,916; arrangements for the purchase of these bonds, owned chiefly by English capitalists, have been made by the Guayaquil and Quito Railway Company. At the end of 1896 the internal public debt was about 7,500,000 sucres.

Since Ecuador has no mint, its coin (silver) is minted in Birmingham, England; Philadelphia, United States; and Lima, Peru. The silver coinage for 1895, 1896, and 1897 amounted to 1,895,558 sucres. The estimated amount of silver in circulation is about 3,000,000 sucres; about two-thirds of this, however, is controlled by two banks at Guayaquil. On October 1, 1899, the sucre was worth \$0.436 in United States currency. There are two banks of issue, the Bank of Ecuador and the Commercial and Agricultural Bank; other banks are the Mortgage Bank and the Territorial Bank.

An attempt is being made to effect the adoption of the gold standard in Ecuador. In November, 1898, a law was enacted, which within two years is expected to place the country on a gold basis. Up to the present time the monetary standard has been

nominally bimetallic, but practically monometallic, since there is no gold in circulation and the silver is irredeemable. The present circulation, however, is almost entirely paper issued by the banks and is redeemable only in silver. "The effect of the newly enacted law, it is believed, will be the redemption of the paper money, which will remain the circulating medium, in gold."

Industries and Commerce.—Ecuador is essentially an agricultural country; there are good prospects for mining ventures, but the industry has not been developed. Among the important products are cacao, coffee, rice, rubber, hides, cinchona bark, vegetable ivory, and tamarinds, all of which to some extent are exported. Other products are various fruits along the coast, and in the interior sugar, cereals, and cabinet and dye woods. The exploitation of rubber is important, being an industry that is remunerative and well adapted to Ecuador. Some attention has recently been given to the planting of rubber trees, as the available supply of wild trees is being speedily exhausted. According to a report of the British consul at Guayaquil, the exports of rubber from that port in 1897 amounted to 590,400 pounds, valued at \$229,831; in 1898, 932,400 pounds, valued at \$454,192. A large porportion of the rubber export that recently went to the United States is now sent to London and other European ports.

Cacao is the product of first importance, Ecuador being the greatest cacao-producing country in the world. The cultivation of cacao is carried on chiefly in the five coast provinces, where the estimated number of trees is placed at 47,200,000; other districts, however, it is said are suitable to the cultivation of this product, and as there is little difficulty in finding a market for it, the cacao acreage in Ecuador will probably increase considerably. The production has been increasing since 1896, and the cacao trade advances at the rate of about 5 or 6 per cent. a year. The reported amount received at Guayaquil in 1896 was 15,327 tons; in 1897, 14,800 tons; in the latter year the total crop was said to be 331,584 quintals (16,579 tons), but a later report placed it at 22,000 tons; the total crop for 1898 was 421,793 quintals (21,089 tons). The entire cacao production of the world, excepting that of Mexico and the Central American states, which satisfies little more than local demand, was reported to be 75,680 tons, of which all but 11,210 tons was produced on the American continent; the 22,000 tons of Ecuador came from the five provinces, as follows: Los Rios, 12,000; Guayas, 4000; El Oro, 3000; Manavi, 2200; Esmeraldas, 800. The cost of cultivating cacao is comparatively small, the net profit being, it is said, from 40 per cent. to 50 per cent. a year; in 1898 the price per 100 pounds at Guayaquil was from 25 sucres to 30.5 sucres (\$12.17 to \$14.84).

The mining industry is almost limited to the taking of gold, though it is known that the country is rich in copper, lead, iron, and coal. Besides the washings of the Indians, gold is taken chiefly at Zarama in the province of Oro, and at Esmeralda; silver is found at Pillzhum in the province of Cañar. Petroleum also exists, but is little utilized. Manufacturing industries are undeveloped, though there are flour-mills, saw-mills, tanneries, distilleries, and sugar, cotton, and hat factories. The principal imports are cotton, textiles, and provisions. The only manufactured article exported to any appreciable extent is straw hats. In 1897 the imports were valued at 18,004,048 sucres and the exports at 31,025,382 sucres respectively.

Shipping and Communications.—Besides about 2000 small river and coasting vessels of from 5 to 80 tons that entered and cleared at the port of Guayaquil in 1897, there entered 192 vessels, aggregating 265,208 tons, and cleared 192 vessels, with the same total tonnage. More than one-half of these was British.

There are few actual roads in Ecuador; for the most part they are merely bridle-paths. There is one highway built for 115 miles from Quito toward Guayaquil, a little more than one-fourth of the distance between the two cities. Communication in the agricultural districts west of the Andes is carried on with some success by river navigation; there are about 17 steamers of American and native build, and a large number of small boats and canoes.

Ecuador has one railway in operation; it connects Durán, opposite Guayaquil, with Chimbo, 58 miles distant. Work on the construction of the Guayaquil and Quito Railway was begun on July 16, 1899. The contract for building this road was made in June, 1897, between the government of Ecuador and Mr. Archer Harman, of New York, and was approved by the congress in November, 1898. The officers of this company are Americans and the board of directors consists of fifteen Americans, three Englishmen, and three citizens of Ecuador. The cost of the road, which the government secures, is placed at \$17,532,000. The distance to be covered, formerly given as 404 miles, is now said to be about 350 miles. Quito is connected by telegraph with the cities of Colombia and with Guayaquil; the total length of telegraph lines in the country is about 1242 miles, and there are about 60 telegraph stations. A telegraphic ocean cable touches at Guayaquil.

Religion and Education.—The state religion is Roman Catholic and other churches are excluded. Primary education is free and nominally compulsory. The primary

schools number 1088; secondary, 35; schools for higher education, 9; the latest report available places the number of pupils at 68,380, and of teachers at 1498. There are technical and commercial schools in Guayaquil and Quito, and in the latter city also a university with a reported enrolment of 32 professors and 216 students.

Fire in Guayaquil.—On November 27, 1899, a large conflagration in Guayaquil destroyed property valued at more than 1,500,000 sucres. Among the buildings burned were the customs house, with all its contents, the San José church, the school, or college, of San Vicente, with the museum of natural history, the bureau of physics and chemistry, and the astronomical observatory.

An Insurrection.—A revolutionary movement, seemingly inspired by the Clerical party, began in the fall of 1898 against the government of President Alfaro, and on December 1 of that year he was given dictatorial powers by the council of state. From the beginning the government party seemed to be the stronger. The decisive battle was fought at San Aucasja on January 24, 1899, when the insurgents were defeated. Tulcan, a stronghold of the rebels, or Clericals, was then taken, and early in March a proclamation of amnesty was issued by President Alfaro; according to this proclamation, amnesty was offered, not to the leaders of the rebellion, but to other insurgents who within thirty days would lay down their arms. It was reported that later in the month order was fairly well established. Far in the interior, however, it was said that the position of Protestant missionaries was still hazardous.

Confiscation of Church Property.—In the fall of the year President Alfaro, the unswerving enemy of the Clerical party, caused no small consternation by his success in having a law passed confiscating all church property to the state; this includes mines, valuable city holdings, and sugar plantations. The law provided that the property be placed under the management of a board of trustees, appointed by the president, and that the proceeds be applied to the support of the state schools. Insurrection was threatened, and the Catholic monastic orders began to convey to laymen, for fictitious considerations, the titles of their property.

EDGAR, Sir JAMES DAVID, K.C.M.G., D.C.L., speaker of the House of Commons in the Dominion Parliament since 1896, died at his home in Toronto, Ontario, July 31, 1899. He was born at Hatley, Quebec, August 10, 1841; was educated at Lennoxville and Quebec, and was admitted to the bar in 1864. In 1872 he was first elected to the Dominion Parliament, sitting for Monek, Ontario; in the following two years, during the crisis caused by the Pacific scandal, he was the Liberal whip. From 1884 he represented the riding of West Ontario in Parliament. He became a Queen's counsel in 1890 and was knighted in 1898. He was a member of the editorial staff and a director of the *Toronto Globe*, and in 1889 was chiefly instrumental in effecting the passage of the copyright act. Besides numerous political pamphlets and several works on Canadian law, he wrote: *The White Canoe; This Canada of Ours, and Other Poems; Canada and its Capital*, 1898.

EDMUNDS, PAUL CARRINGTON, ex-member of Congress, died at his home in Halifax County, Va., March 12, 1899. He was born in Halifax County, November 1, 1836; was educated privately until he entered the University of Virginia. He graduated in law at William and Mary, practised for two years at Jefferson City, Mo., and returned to his native county, where he thereafter resided. He was elected to the State Senate in 1881 and 1884; in the latter year was a delegate to the Democratic National Convention at Chicago. He served as a Democrat from 1889 to 1895 in the Fifty-first, Fifty-second, and Fifty-third Congresses.

EDUCATIONAL ASSOCIATION, NATIONAL, held its thirty-eighth annual convention at Los Angeles, Cal., in July, 1899. The three subjects of greatest interest discussed were continued education of adults after the brief period of school life, school administration, and college entrance requirements. Among the important papers delivered before the convention were a discussion of an *Educational Policy for Our New Possessions*, by Dr. W. T. Harris, commissioner of education; and *Usefulness of Universities*, by President D. S. Jordan, of Leland Stanford Junior University. The joint committee of the departments of secondary and higher education, formed in 1895, to investigate the matter of college entrance requirements, reported that "the principle of election should be recognized in secondary schools." Professor O. T. Corson, of Columbus, O., was elected president for the ensuing year. The association has about 2000 active and 8000 associate members, and a permanent invested fund of about \$65,000.

EDUCATION IN THE UNITED STATES. The year 1899 in the United States was marked by events of some importance in higher education. Three of the greatest universities in the United States inaugurated new presidents. Most popular interest was shown in the installation of Professor Arthur Twining Hadley as president of Yale University on October 18. The Rev. Dr. W. H. P. Faunce was made president of Brown University on October 17, and Professor Benjamin Ide Wheeler

was made president of the University of California on October 25. Dr. George Harris was installed as president of Amherst College on October 11, and Miss Caroline Hazard was made president of Wellesley College for women on October 3. The increase of attendance at the various schools and institutions of higher learning is noticeable, and is regarded as a gratifying index of increasing popular prosperity. A statistical account of this increase is given under the title *UNIVERSITIES AND COLLEGES (q. v.)* Two notable features in the educational progress of the year 1899 are: First, the recognition of the importance of co-ordination in the whole system of physical and mental training from the earliest years. An expression of this widespread interest in the general problems is seen in the number of literary works of the first importance on the theory of education which have appeared in the United States. Among them are the *Discussions on Education* of the late General Francis A. Walker, who was president of the Massachusetts Institute of Technology; *Talks to Teachers on Psychology*, by William James, professor of psychology in Harvard University; *Psychology and Life*, by Hugo Münsterberg, Professor James's colleague; *Letters to a Mother*, by Miss Susan E. Blow; *The Meaning of Education*, by Professor Nicholas Murray Butler, of Columbia University; and *The Psychologic Foundations of Education*, by Dr. William T. Harris, the United States commissioner of education. The second important point in the history of education in this country during the year is the continued effort which is being made in many States of the Union to sever the connection between politics and the administration of the public schools, and to organize the latter on a systematic and independent basis. It has been pointed out that a great aid in this direction is the gradually increasing interest taken by women in school problems. The most noticeable advance in separating education from politics has been seen in the reform agitation taking place in New York, Boston, Chicago, San Francisco, Milwaukee, St. Louis, Philadelphia, Baltimore, Buffalo, Detroit, and Toledo. Though the efforts of the reformers have met with defeat, as in Chicago, it is believed that defeat is not final, but that eventual victory is only postponed.

The total enrolment in schools and colleges, both public and private, during the year 1897-98 was reported as 16,687,643, this being an increase of 432,550 over the previous year. Not included in these figures are the pupils of various miscellaneous schools, such as evening schools, business and Indian schools, reform and benevolent institutions, etc., the total enrolment of such being 485,292. Hence the grand total is 17,172,935. In the public elementary schools the average length of the school term reached 143.1 days in 1897-98. The total expenditures for the public elementary or common schools in 1897-98 was \$194,020,470. The statements made in this paragraph are taken from the last report of the United States commissioner of education, and the following tables are either copied or compiled from the same report.

Total number of pupils and students of all grades in both public and private schools and colleges, 1897-98.

NOTE.—The classification of States made use of in the following table is the same as that adopted by the United States census, and is as follows: *North Atlantic Division*: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania. *South Atlantic Division*: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida. *South Central Division*: Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Arkansas, and Oklahoma. *North Central Division*: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas. *Western Division*: Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon, and California.

DIVISION.	Pupils receiving elementary instruction (primary and grammar grades).		Pupils receiving secondary instruction (high-school grade).*	
	Public.	Private (largely estimated).	Public.†	Private (in preparatory schools, academies, seminaries, etc.)
The United States.....	14,589,036	1,349,665	459,818	166,302
North Atlantic Division.....	3,472,716	510,286	143,977	50,635
South Atlantic Division.....	2,110,342	88,741	25,729	22,371
South Central Division.....	2,842,478	143,872	84,658	32,473
North Central Division.....	5,443,994	467,933	228,358	51,562
Western Division.....	719,506	88,833	27,091	9,361

* Including pupils in preparatory or academic departments of higher institutions, public and private, and excluding elementary pupils, who are classed in columns 2 and 3.

† This is made up from the returns of individual high schools to the bureau, and is somewhat too small, as there are many secondary pupils outside the completely organized high schools whom there are no means of enumerating.

STUDENTS RECEIVING HIGHER INSTRUCTION.

DIVISION.	In universities and colleges.*			In schools of medicine, law, and theology.†			In normal schools.‡		
	Public.†	Private.	Total.	Public.§	Private.	Total.	Public.	Private.	Total.
The United States.....	29,728	71,330	101,058	8,096	46,126	54,221	66,245	21,396	97,586
North Atlantic Division.....	5,072	26,667	31,739	254	17,366	17,620	19,470	1,724	21,194
South Atlantic Division.....	3,688	10,153	13,841	768	6,112	6,875	4,445	1,449	5,894
South Central Division.....	2,815	10,786	13,601	1,099	4,668	5,767	2,969	4,365	7,354
North Central Division.....	14,184	80,771	94,955	5,392	16,693	22,085	15,542	12,145	28,687
Western Division.....	3,969	2,989	6,958	689	1,295	1,984	3,789	710	4,499

DIVISION.	Summary of higher (including normal) instruction.		Summary of pupils by grade.			Summary according to control.		Grand total.
	Public.	Private.	Elementary.	Secondary.	Higher.	Public.	Private.	
The United States.....	84,060	138,756	15,838,701	686,115	222,637	15,132,918	1,554,735	16,687,653
North Atlantic Division.....	24,796	45,737	3,983,002	194,612	70,553	3,641,489	606,078	4,247,567
South Atlantic Division.....	8,896	17,720	2,199,068	48,100	26,615	2,144,966	128,688	2,273,708
South Central Division.....	6,913	19,723	2,966,250	67,131	26,641	2,894,949	196,673	3,090,122
North Central Division.....	35,018	50,609	5,911,937	279,920	85,637	5,707,370	570,104	6,277,474
Western Division.....	8,447	4,944	758,339	86,352	13,391	755,044	53,086	808,089

Whole number of students receiving higher education (including students in undergraduate and graduate departments of universities and colleges, colleges for women, schools of technology, and in professional schools and departments.

	Universities and colleges for men and for both sexes.		Colleges for women — Division A. (a)		Colleges for women — Division B. (b)		Schools of technology.		Professional schools and departments (law, medicine, and theology).		Total number of students in higher education.	
	Male.	Female.					Male.	Female.	Male.	Female.	Male.	Female.
United States.....	58,407	17,765	4,416	10,570	8,611	1,289	41,677	1,743	108,695	35,782		
North Atlantic Division.....	21,747	2,505	3,879	902	2,532	174	13,507	542	87,786	8,008		
South Atlantic Division.....	6,537	818	473	4,396	1,611	12	5,609	90	13,757	5,788		
South Central Division.....	6,476	2,389	.....	3,800	896	49	5,009	52	19,381	6,290		
North Central Division.....	20,031	9,999	43	1,428	2,765	689	16,230	911	39,026	13,070		
Western Division.....	3,616	2,054	22	44	807	365	1,332	147	5,745	2,632		

(a) Division A includes Mills College, Mills College, Cal.; Rockford College, Rockford, Ill.; Woman's College, Baltimore, Md.; Radcliffe College, Cambridge.

* Including colleges for women, agricultural and mechanical (land-grant) colleges, and scientific schools. Students in law, theological, and medical departments are excluded, being tabulated in columns 5-7. Students in academic and preparatory departments are also excluded, being tabulated in columns 4 and 5 of previous table.

† Mainly State universities and agricultural and mechanical colleges.

‡ Including schools of dentistry, pharmacy, and veterinary medicine.

§ Mainly in schools or departments of medicine and law attached to State universities.

¶ Non-professional pupils in normal schools are included in columns 4 and 5 of previous table.

‡ There are, in addition to this number, 21,687 students taking normal courses in universities, colleges, and public and private high schools.

Mass.; Smith College, Northampton, Mass.; Mount Holyoke College, South Hadley, Mass.; Wellesley College, Wellesley, Mass.; Wells College, Aurora, N. Y.; Elmira College, Elmira, N. Y.; Barnard College, New York City; Vassar College, Poughkeepsie, N. Y.; Bryn Mawr College, Bryn Mawr, Penn., and Randolph-Macon Woman's College, Lynchburg, Va.

(b) Division B includes all women's colleges not in Division A.

Statistics of the property and income of collegiate institutions for 1897-98 are as follows:

Property of universities and colleges for men and for both sexes.

	Number of fellowships.	Number of scholarships.	Libraries.			Value of scientific apparatus.	Value of grounds and buildings.	Productive funds.
			Bound volumes.	Pamphlets.	Value.			
United States.....	417	7,077	7,096,235	1,354,966	\$9,096,502	\$11,004,532	\$126,211,099	\$119,632,051

Income of universities and colleges for men and for both sexes.

	Tuition fees.	From productive funds.	State or municipal appropriations.	United States Government appropriations.	From other sources.	Total income.	Benefactions.
United States.....	\$7,130,952	\$8,653,688	\$3,398,907	\$954,001	\$2,176,836	\$19,213,371	\$7,532,320

Property of colleges for women, Division A.

	Fellowships.	Scholarships.	Libraries.			Value of scientific apparatus.	Value of grounds and buildings.	Productive funds.
			Volumes.	Pamphlets.	Value.			
United States.....	17	254	177,129	14,238	\$366,625	\$229,394	\$6,390,396	\$4,132,473

Income of colleges for women, Division A.

	Tuition fees.	From productive funds.	From other sources.	Total income.	Benefactions.
United States.....	\$736,122	\$320,446	\$387,780	\$1,444,350	\$480,461

For a list of collegiate institutions, with statistics thereof, see UNIVERSITIES AND COLLEGES.

The following table gives in more detail statistics relating merely to the public common schools. The figures are for the year 1897-98:

STATE OR TERRITORY.	Pupils enrolled.	Average number of pupils actually present at school each day.	Average number of days the schools were kept during the year.	Whole number of different teachers employed.			Estimated value of all school property.	Total amount expended for schools.
	1897-98.	1897-98.	1897-98.	Male.	Female.	Total.		1897-98.
United States	15,038,696	10,286,092	143.1	131,750	277,443	409,193	\$492,703,781	\$194,020,470
North Atlantic Division..	3,614,463	2,587,468	174.5	19,231	80,732	99,963	198,197,537	75,902,063
South Atlantic Division..	2,134,725	1,314,622	112.7	20,199	26,605	46,804	22,266,065	12,163,944
South Central Division...	2,875,366	1,870,510	98.6	31,317	29,167	60,484	21,760,411	13,219,921
North Central Division...	5,669,572	3,996,895	152.4	54,911	124,442	179,353	211,848,908	78,157,540
Western Division	744,510	516,597	151.8	6,092	16,497	22,589	38,630,860	14,577,002
North Atlantic Division:								
Maine	134,405	97,616	137	*1,257	*5,470	6,727	4,225,401	1,614,330
New Hampshire	*64,207	*47,717	*134.55	*202	*2,509	*2,711	3,284,121	*1,040,309
Vermont	65,532	48,060	154	389	2,397	2,786	1,800,000	933,424
Massachusetts	456,141	349,147	186	1,174	12,029	13,203	39,077,405	13,653,649
Rhode Island	65,384	47,370	191	193	1,650	1,852	4,579,334	1,717,492
Connecticut	147,833	105,002	188.82	373	3,570	3,943	9,879,922	2,986,163
New York	*1,303,199	827,652	176	*5,461	*28,924	*34,385	71,832,511	28,588,871
New Jersey	304,680	200,378	185	834	5,442	6,276	14,601,840	5,723,424
Pennsylvania	1,173,082	864,626	159.4	9,348	18,732	28,080	*48,917,003	19,644,401
South Atlantic Division:								
Delaware	*33,174	*22,603	*160	*218	*622	*840	*904,426	*275,000
Maryland	236,003	134,539	182	1,144	3,843	4,987	*4,500,000	2,709,104
District of Columbia..	44,698	34,383	185	148	959	1,107	3,750,000	1,251,035
Virginia	*367,817	213,421	*120.2	*3,013	*5,562	*8,575	3,000,777	*1,827,003
West Virginia	236,188	159,768	111	4,096	2,712	6,808	3,471,697	2,046,623
North Carolina	399,375	214,540	68.8	3,695	3,522	7,217	970,675	931,141
South Carolina	*258,183	*182,559	*83.2	*2,245	*2,728	*4,973	845,596	*697,003
Georgia	450,832	278,715	*116.9	4,519	4,986	9,505	3,977,070	1,758,101
Florida	108,455	74,004	104	1,121	1,071	2,192	755,824	668,241
South Central Division:								
Kentucky	*501,893	*308,697	*115.4	*4,909	*5,051	*9,960	*5,448,814	*2,650,190
Tennessee	*481,585	*338,176	*90.2	*5,121	*4,014	*9,135	*3,133,780	*1,690,759
Alabama	*348,899	*222,690	*80.1	*4,741	*2,778	*7,519	*1,500,000	*800,273
Mississippi	*367,579	*223,900	*101.6	*3,649	*4,254	*7,903	*1,636,055	*1,165,840
Louisiana	182,341	132,046	106.3	1,362	2,472	3,834	*1,066,000	956,883
Texas	*612,140	*404,372	*106	*6,179	*6,774	*12,953	6,081,356	*4,320,271
Arkansas	303,808	191,447	69	4,515	2,558	7,073	2,294,397	1,220,263
Oklahoma	77,121	49,182	86.3	841	1,266	2,107	600,000	415,347
North Central Division:								
Ohio	810,385	618,667	162	10,358	14,898	25,256	41,428,289	12,563,949
Indiana	566,157	432,931	144	7,197	8,026	15,223	21,536,212	7,846,139
Illinois	939,163	729,227	158.7	6,718	18,549	25,267	43,705,943	16,468,055
Michigan	496,025	*347,714	160.8	3,625	12,048	15,673	18,138,589	6,281,003
Wisconsin	435,914	*287,000	*160	2,654	9,811	12,465	*14,800,000	5,132,003
Minnesota	384,063	*243,200	156	2,304	8,939	11,243	14,559,564	4,893,678
Iowa	548,852	370,845	162	5,855	22,839	28,694	17,450,534	8,451,504
Missouri	688,583	440,692	141.7	5,951	9,815	15,266	16,718,410	6,248,961
North Dakota	67,375	41,155	122	1,115	2,522	3,637	2,132,738	1,288,031
South Dakota	*89,001	*54,600	*138.4	*1,321	*3,187	*4,508	*2,029,744	*1,280,603
Nebraska	273,914	173,930	131	2,433	7,175	9,608	8,943,924	3,712,017
Kansas	370,240	256,934	124.3	5,380	7,133	12,513	9,504,961	3,901,477
Western Division:								
Montana	35,070	*23,400	*149.2	201	885	1,086	1,857,964	776,150
Wyoming	13,042	*8,700	*110	102	434	536	441,460	213,291
Colorado	104,733	69,973	*159.7	744	2,238	2,982	5,987,708	2,341,311
New Mexico	26,484	16,950	96.6	333	270	603	*281,000	154,532
Arizona	14,613	9,011	130	156	279	435	472,108	229,323
Utah	70,878	49,638	157	502	837	1,339	2,652,595	1,047,174
Nevada	7,348	4,982	154	40	274	314	265,011	203,642
Idaho	29,737	21,528	100	324	524	848	597,718	274,377
Washington	97,916	64,192	148	1,063	2,288	3,351	4,977,679	1,795,795
Oregon	85,230	62,790	123.9	1,250	2,443	3,693	3,748,154	1,274,937
California	259,459	185,424	172.4	1,407	6,025	7,432	17,349,468	6,266,470

* Approximate.

Commercial Education has in the last few years been carried on in several European countries. In Germany a commercial course was offered for the first time in the University of Leipsic in 1898, and others are now projected for Rhenish Prussia and for Magdeburg; and it is proposed to select consuls from the graduates of such schools. The Italian government aids in the support of a commercial school at Venice; and in Belgium consuls are selected from the higher commercial schools of Antwerp. In May, 1899, an international congress of commercial education was held at Venice.

In the United States commercial education began as early as 1840. In 1890 there were 263 business schools, with 78,920 students, which in 1894 had grown to 518 schools and 115,748 students; but in 1898 there were only 337 commercial schools and 70,950 students, the decrease being explained by business depression and the commercial courses offered in public high schools. There were in that year 172 universities and colleges, with 5869 students taking commercial or business courses. The most prominent institutions giving commercial courses are the Wharton school of finance of the University of Pennsylvania, the college of commerce of the University of California, and the college of commerce and politics, of the University of Chicago. There were 1108 public high schools giving commercial education to 31,633 students in the United States in 1898. The latest report of the commissioner of education contains the following table, showing the number of students in commercial courses in five classes of institutions in the United States for the year 1897-98:

In universities and colleges.....	5,869
In normal schools.....	5,721
In private high schools and academies.....	9,740
In public high schools.....	31,633
In commercial and business colleges.....	70,950

Total for United States.....123,913

Dental Education in the United States.—This country has led the world in the art of dentistry, its dentists having an enviable reputation both in America and in foreign lands. The specialization of dentistry was recognized in the United States as early as 1840 by the foundation of the Baltimore College of Dental Surgery. In 1884, when dentistry was first taught in the University of Berlin, in Germany, there were twelve dental schools in the United States. The dental schools of this country have a more centralized control than any other branch of education, being directed by the National Association of Dental Examiners, the National Association of Dental Faculties, and the National Dental Association, an association of practitioners. The last-named society has passed the following resolutions, which secure uniformity in the American dental colleges: "Each dental college, in order to be placed on the list of recognized colleges, must have a teaching faculty composed of at least six individuals, and said faculty must teach the following branches: Operative dentistry, dental pathology, dental prosthetics, and oral surgery; also the six branches: Anatomy, physiology, general pathology (fundamentals), materia medica and therapeutics, and general surgery. Their students must also be taught the subjects of chemistry and bacteriology in laboratories adapted to the purpose and under suitable instructors. Each college must possess, in addition, suitable lecture rooms, a well-appointed dental infirmary, and a general prosthetic laboratory, and must also furnish, in this way, systematic instruction to its students. It is inadvisable for a member of an examining board to be connected with a dental college in any capacity whatever." There are at present in the United States 52 colleges of dentistry recognized as being "of good standing" by the Association of Dental Faculties.

Education of the Colored Race.—For the year 1897-98 the total enrolment in the public schools of the sixteen former slave States and the District of Columbia was 5,620,553, the number of white pupils being 4,113,811, and of colored pupils, 1,506,742. The average daily attendance in the white schools was 2,659,809, or 64.66 per cent. of the white enrolment, and the colored schools 916,833, or 60.85 per cent. of the colored enrolment. The total expenditure for public schools in the year 1897-98 was \$31,217,479, and the part of this spent for public schools for colored children was estimated at about \$6,575,000. For the education of colored youth above the primary grade there are about 180 schools in the United States. From some of these institutions statistics are not available. To 161, however, the following figures apply:

Teachers and students in institutions for the colored race in 1897-98.

State.	Number of schools.	Teachers.			Students.											
					Elementary.			Secondary.			Collegiate.			Total.		
		Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.
Alabama.....	11	90	95	185	1,186	1,077	2,263	960	946	1,906	80	44	124	1,846	1,767	3,613
Arkansas.....	7	80	23	103	226	310	536	218	309	527	48	12	60	602	631	1,233
Delaware.....	1	6	1	7	6	3	9	13	6	19	14	5	19	28	14	42
District of Columbia.....	4	80	21	101	287	286	573	271	266	537	207	26	233	985	922	1,907
Florida.....	6	12	25	37	308	413	721	89	128	217	0	0	0	387	541	928
Georgia.....	19	74	136	210	1,457	2,439	3,896	900	785	1,685	191	91	282	2,808	3,815	6,623
Illinois.....	1	1	1	2	20	32	52	20	22	42	0	0	0	20	32	52
Indiana.....	2	2	2	4	32	32	64	46	26	72	0	0	0	72	26	98
Kentucky.....	7	48	48	96	514	760	1,274	429	553	982	12	3	15	955	1,346	2,301
Louisiana.....	6	44	57	101	853	1,217	2,070	122	189	311	72	26	98	1,057	1,442	2,499
Maryland.....	6	14	29	43	89	180	269	101	196	297	22	26	48	163	291	454
Mississippi.....	10	28	60	88	450	562	1,012	481	241	722	61	30	91	992	853	1,845
Missouri.....	5	19	12	31	190	194	384	195	239	434	58	63	121	443	496	939
New Jersey.....	1	5	7	12	.....	.....	.....	59	57	116	0	0	0	59	57	116
N. Carolina.....	21	97	87	184	810	1,860	2,670	732	900	1,632	258	82	340	1,500	2,342	4,142
Ohio.....	2	18	10	28	45	45	90	41	41	82	115	98	206	301	179	480
Pennsylvania.....	8	14	10	24	60	132	192	65	75	140	293	0	293	358	227	585
S. Carolina.....	11	40	74	114	857	1,017	1,874	451	535	986	23	22	45	1,021	1,024	2,045
Tennessee.....	13	72	102	174	1,599	2,101	3,700	451	674	1,125	230	28	258	2,230	2,813	5,143
Texas.....	8	30	62	92	719	1,029	1,748	222	249	471	52	20	72	993	1,286	2,279
Virginia.....	14	77	130	207	1,412	1,723	3,135	447	983	1,430	95	0	95	1,954	2,706	4,660
W. Virginia.....	3	11	12	23	92	124	216	106	117	223	.....	.....	.....	196	241	437
Total.....	161	804	1,004	1,808	11,100	15,067	26,167	5,989	7,680	13,669	1,912	680	2,492	19,001	23,827	42,828

Normal Schools.—All the States but Wyoming and Nevada have public normal schools. The States having 5 or more are: New York and Pennsylvania, 15 each; Massachusetts, 10; West Virginia, Wisconsin, North Carolina, and Mississippi, 7 each; Alabama, 6; Ohio, Iowa, Minnesota, and Missouri, 5 each. The following table shows the number of normal schools of various classes, with the number of normal students:

Classes of Institutions.	1895-96.		1896-97.		1897-98.	
	Institutions.	Students.	Institutions.	Students.	Institutions.	Students.
Public normal schools.....	160	40,421	164	41,109	167	41,265
Private normal schools.....	169	20,777	198	24,161	178	21,293
Public universities and colleges.....	27	1,691	30	1,639	23	2,255
Private universities and colleges.....	166	5,325	166	4,630	168	6,066
Public high schools.....	447	8,246	507	9,001	494	7,378
Private high schools.....	439	7,930	422	7,064	386	5,969
Grand total.....	1,408	84,400	1,467	89,364	1,376	89,225
In all public institutions.....	634	50,858	701	54,039	694	55,678
In all private institutions.....	774	33,542	766	35,325	682	33,547

Manual Training Schools.—In 1896 there were 121 cities of 8000 population and over in whose public schools manual training other than drawing was taught; in 1898 the number of such cities was 146. For the year 1897-98 there were reported to the commissioner of education 114 schools distinctively for manual or industrial training, an increase of 15 over the preceding year. Of these schools, 24 were industrial schools for Indian children. For the Indian schools there were employed 272 teachers, and the attendance was 4790—2705 boys and 2085 girls.

Summary of statistics of manual and industrial training schools in the United States in 1897-98.

	Number of schools.	Different teachers who received manual and industrial training.			Different pupils who received manual and industrial training.			Expenditure for manual and industrial training during 1897-98 for 86 schools.				
		Male.	Female.	Total.	Male.	Female.	Total.	For teachers.	For materials.	For new tools and repairs.	For incidentals.	Total.
United States.....	114	507	428	945	19,152	11,531	30,683	\$440,572	\$92,058	\$28,508	\$28,100	\$588,237

Education of the Blind.—The number of schools reported for 1897-98 was 36, with 383 teachers and 3744 pupils—1942 males and 1802 females. Among the courses pursued, the following may be mentioned: Kindergarten, by 467 pupils; vocal music, by 1952; instrumental music, by 1893; industrial, by 2131. The total expenditure for the support of the schools was \$707,435. The value of grounds and buildings was \$6,069,900 and of scientific apparatus, \$83,815. The total number of volumes in the libraries was 89,641.

Education of the Deaf.—The number of schools for the deaf reported for 1897-98 was 205, with 1100 instructors and 10,878 pupils. These pupils were apportioned as follows: State public schools, 9832; private schools, 483, and public day schools, 563. The total expenditures for support of the State public schools were \$2,208,704; the value of their grounds and buildings was \$11,175,933, and their libraries contained 94,269 volumes. The amount expended for the support of the public day schools was reported at \$41,675. Of the pupils in the State public schools, 3205 were taught by the "combined" system, 2946 by the oral, and 3616 by the manual, and 670 in the kindergartens.

Education of the Feeble-Minded.—In 1897-98 there were reported 29 schools, with 1049 instructors and 9232 pupils. The instructors were apportioned as follows: In school departments, 259; in industrial departments, 180; caretakers of inmates, 610. Of the total number of pupils, 1749 were enrolled in music departments and 943 in the kindergartens. Of the whole number of schools, 19 were State public schools, with 8866 inmates. The expenditures of the State public schools in 1897-98 were \$1,414,451 and the value of their grounds and buildings \$4,922,537. The 10 private schools, with 366 pupils, were distributed as follows: Connecticut, Illinois, Maryland, and Michigan, 1 each; Massachusetts and New Jersey, 3 each.

Reform Schools.—The number of schools reported in 1897-98 was 87, with 518 instructors and 18,080 pupils in the industrial departments and 23,501 pupils in the school departments, while the number of inmates, 19,771 white and 3267 colored. "The number committed to the institutions during the year was 12,773, and the number discharged was 12,003. When discharged from the schools all could read and write, and a large number had received the equivalent of a common-school education." The value of the grounds and buildings of these institutions was \$18,631,147; the total expenditures for the year amounted to \$4,116,322, of which \$569,555 were on grounds and buildings and the remainder for support.

EGYPT. A country of northern Africa, under the nominal suzerainty of the Turkish Sultan, but practically a dependency of Great Britain; bounded on the north by the Mediterranean Sea, on the east by Arabia and the Red Sea, on the south by the extensive tract known as the Egyptian Soudan, and on the west by Tripoli and the Libyan desert in the French Sahara country.

Population and Area.—In regard to the population of Egypt, including not only native residents, but tribes of nomads, a large colony of European settlers, and a floating population of foreigners, it has been possible only in recent years to obtain anything like an accurate estimate. However, the number of inhabitants has gradually increased under the improving social and other conditions of the past hundred years. Thus, Napoleon placed the population at about the beginning of the century at 2,500,000, when the people were degraded under a few royal masters. Fifty years later, as nearly as can be learned, the population was 4,500,000, and in 1875 it was 6,000,000. In 1897 a fairly accurate census was made under British supervision, and gave the population of Egypt between Wady Halfa and the Mediterranean as 9,750,000. There were 9,008,000 native Egyptians; 40,000 inhabitants from other

Ottoman states, and 574,000 Bedouins, of whom 89,000 were nomads and the rest "semi-sedentary." Foreign residents, numbering 112,500, comprised 38,000 Greeks, 24,500 Italians, 19,500 British (including 6500 Maltese and 5000 military), 14,000 French (including 4000 Algerians and Tunisians), 9000 Austrians, 1400 Russians, 1300 Germans, and a remainder divided among 10 nationalities. Some 200 Americans only live in Egypt. The capital, Cairo, has 570,000 inhabitants; Alexandria, the commercial centre, has 320,000; and Tanta, the largest inland delta town, has 57,000. Zagizig and Mansurah have 3500 each; Port Said, 4200; Suez, 17,000, and Ismailia, 7000. In Upper Egypt, Assiat has 42,000 and Keneh 24,000 inhabitants.

The area of Egypt proper, including the oases in the Libyan Desert, between the Nile and the Red Sea, and El Araish in Syria, excluding the Soudan, is about 400,000 square miles. The area of the Soudan, recently recovered by Egypt, with British co-operation, from the Mahdi, is considerably more than twice as large. Though Egypt proper has twice the area of France, habitable Egypt, stretching from the second Nile cataract to the Mediterranean, with a width along the river of five-eighths of a mile to 14 miles, is scarcely as large as Belgium, embracing but 10,500 square miles. This fertile strip practically supports the Egyptian population, and upon this fact Mr. F. C. Penfield, former United States diplomatic agent and consul-general to Egypt, has based his estimate that Egypt has a density of population of 928 to the square mile, as compared with Belgium, 540; Great Britain, 315; Germany, 224, and France, 186. To make this statement credible, he explains, in his recent book, *Present-Day Egypt*, that in Egypt practically every acre not belonging to the desert is under cultivation, sometimes producing three crops a year. It is this fact which makes it possible for 928 persons to the square mile to be supported.

Commerce and Production.—The wonderfully fertile valley of the Nile produces an annually increasing amount of cotton, sugar, and cereals, and agriculture will be still further benefited by the irrigation system soon to be completed. The commerce of Egypt is in consequence already larger than that of any other division of the continent, excepting British South Africa. The bulk of the commerce of Egypt, in particular the imports, is in the hands of Great Britain, although other countries are making a strong effort toward securing a part of the valuable Egyptian trade. Italy and Belgium have been especially active in this direction. The latest results of the efforts of Italy to procure an Eastern market for her goods is the establishment of a display house at Port Said, wherein are shown the cotton products of the Lombardy looms, the porcelain and glassware of Milan, the silk goods of Como, etc. This enterprise, established in August, 1899, took orders during the first two months to the amount of \$7720. Among other prominent departments of foreign trade are the cotton piece-goods imports, handled almost wholly by German and French firms. In woollen goods France, Italy, and Germany are strong competitors with England; America imports considerable machinery, and locomotives. In August the great Atbara bridge, for the railroad of Khartoum, was opened. The contract for this bridge had been given to an American firm, which offered to deliver the material in 42 days at a cost of \$31,629, whereas the best English offer was for delivery in 6½ months at a cost of \$51,044. This American award created much discussion in trade circles, and was resented by English firms, who believed that the contract should have been given to a British concern irrespective of the advantages afforded by foreign offers. The past few years have been marked by unusual activity in engineering works in Egypt. The great Nile dam, discussed below, has been supplemented by the construction of bridges, light railroads, and factories, especially concerns for the rapidly developing sugar industry. France, Germany, Belgium, England, and America furnish the railroad supplies. The electric trade is increasing, and there is a growing demand for pumping machinery, due to government permission to irrigate in Upper Egypt.

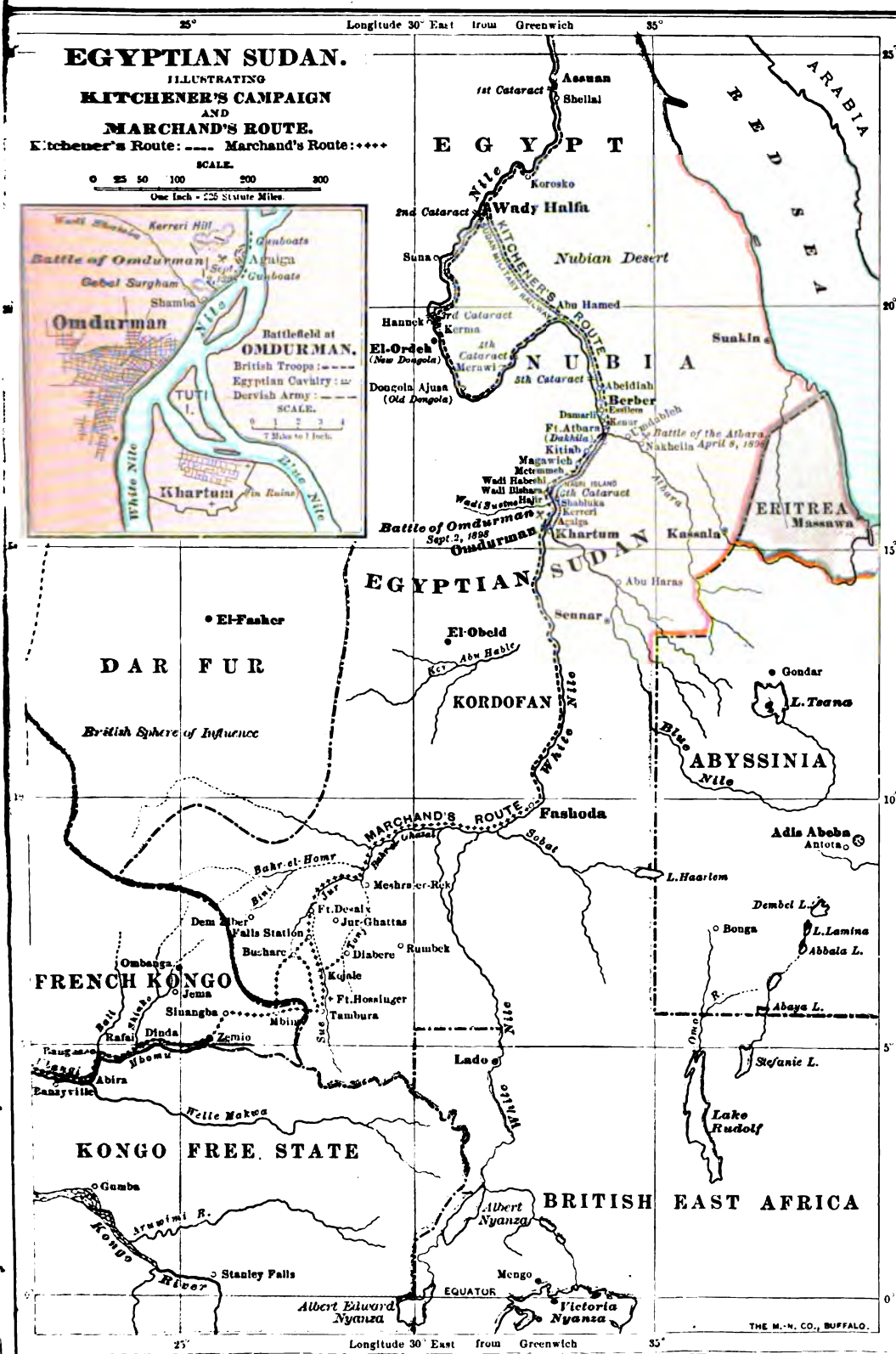
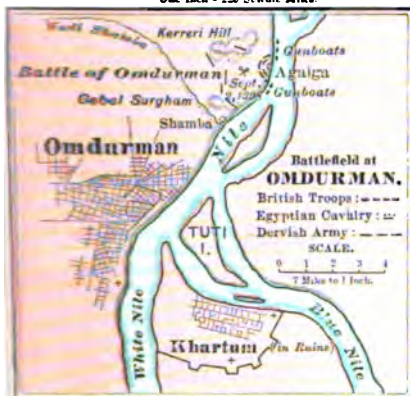
Egyptian imports for 1898 amounted to £11,309,049 and the exports to £12,100,308. Imports have steadily increased in recent years. Great Britain, the greatest importer into Egypt, supplies goods to the amount of 3,536,425 Egyptian pounds (the Egyptian pound being \$4.943); the amount supplied in 1897 from the United States was about 118,072 pounds. The principal imports are cotton manufactures, valued at 3,526,666 Egyptian pounds in 1897; cereals and vegetables, 1,196,409; wood and coal, 1,178,954; metals and metal goods, 1,128,867; spirits, oils, etc., 636,303; tobacco, 521,518; animals and food products, 374,848. Of the exports, which include cotton, cotton-seed, cane sugar, beets, onions, skins, drugs, and natural woods, the largest trade is that in raw cotton, valued in 1897 at 8,989,445 pounds. Cereals exported were worth 2,389,030 pounds; provisions and drugs, 645,928, and skins and leather goods, 89,244. Poor growth in the interior somewhat reduced the cotton crop of that year, but the trade in that product continues to increase annually, particularly with the United States, and has more than doubled in the last two decades. Indeed, the production of Egyptian cotton and sugar-cane may in time become a serious menace to the United States cotton and sugar trade. The cotton crop is wholly exported, and

ILLUSTRATING
KITCHENER'S CAMPAIGN
 AND
MARCHAND'S ROUTE.
 Kitcheners's Route: --- Marchand's Route: + + + +

SCALE.

0 25 50 100 200 300

One Inch = 25 Statute Miles.



produces nearly \$60,000,000 a year. Of this the United States already buys \$4,000,000 worth, in spite of the extent of her own Southern cotton fields. In addition, the cotton crop of the Nile valley reduces more and more each year the dependence of British manufacturers upon the cotton producers of the United States. Ex-Consul-General Penfield says: "An average year's crop is now equal to 1,100,000 bales of 500 pounds each, sold in foreign markets at 2 cents per pound in excess of quotations for good American upland cotton. It is its fibre, nearly an inch and a half long, that gives Egyptian cotton its peculiar value, and the magical fecundity of the Nile soil permits the harvesting of a crop averaging five hundredweight to the acre. This is twice the production of the American acre and the Egyptian has no dread of frost, while he pays his labor only 15 to 18 cents per capita. His prosperity is assured so long as the Southern planter accepts the opinion that long-fibre cotton can be grown only on the Nile, and that European manufacturers will always be content to use the American common staple." He quotes as a conservative estimate the statement that within five years Egypt will produce a million and a third bales of cotton. (See COTTON AND THE COTTON INDUSTRY.) While Lower Egypt is devoted to cotton culture, Middle and Upper Egypt are largely given over to the cultivation of sugar, an Egyptian product of superior quality, which brings into the country nearly \$10,000,000 a year. Of this article also the United States is a liberal buyer. The cultivation of sugar-cane in Egypt is developing greatly, and much European capital is being invested at the present time in the erection of crushing factories supplied with the most highly perfected machineries. Large tracts are also being opened up to the growing of breadstuffs.

Irrigation and the Suez Canal.—The great dam now building at Assuan, on the Nile, is of course the greatest irrigating project of Egypt—it may be safely said that it is one of the most colossal engineering feats of any country. It has been aptly spoken of as a modern addition to the ancient Egyptian engineering tasks represented by the pyramids and the obelisks, and it is interesting to note that it is being built from the very quarries whose rock was used for the obelisks. The Assuan dam will raise the waters of the Nile nearly fifty feet and create in the midst of an African desert a lake 150 miles in length. Water will be forced by side canals through many thousands of acres, 2500 square miles being rescued from the Libyan and Nubian deserts alone. The financial benefits of this great irrigation system will fully supplement the increased agricultural production caused by it. The benefits include not only the regulation of the flooding of the Lower Nile valley and the increased amount of land watered elsewhere, but the indirect effect on railroad and foreign trade interests. The financial benefits will mean, according to present estimates, an increase of production by 25 per cent. and the addition of \$10,000,000 annually by the development of cotton culture alone. The added irrigation, it is claimed, will permanently benefit Egypt to the total amount of \$100,000,000, the estimate including the resulting sale of water, the tax on land rendered fruitful, the sale of reclaimed public lands, and the indirect revenue accruing from the country's increased prosperity and from the development of customs and railroad income. (For some details of construction see the article DAMS.) The Suez Canal, the other modern Egyptian enterprise of magnitude, again proved its value as a naval waterway by the operations of the Spanish and American fleets in 1898. It incidentally turned renewed attention to the need of a Nicaraguan or Panama route between the Atlantic and Pacific. In commenting upon the meagre American representation among commercial vessels using the Suez Canal, Consul Penfield has reported that in contrast, though American trade apparently had derived no benefit, the United States government had paid an immense sum during 1898-99 in tolls for war-ships, transports, and men, *en route* to or from the Philippines. The amount was more than had been paid the canal by this country during the previous twenty years. The fact that there was a canal for use when the emergency arose was made an argument for United States government construction of the Nicaraguan Canal. The development of Suez traffic was given as follows: For 1871, 1876, 1881, 1886, 1891, and 1896—steamers, 765, 1457, 2727, 3100, 4206, and 3407 in number for those respective years; receipts, 7,595,385, 27,631,455, 47,193,880, 54,771,075, 83,421,500, and 79,652,175 francs.

History.—The most important matter in the history of Egypt during 1899 was the reconstruction of the Soudan. A convention providing for the administration of the Soudan was signed by representatives of Great Britain and Egypt on January 19, 1899. This placed the Soudanese provinces under the Egyptian and British flags, and entrusted their government to a governor-general, who was to have the supreme military as well as civil command, and was to be appointed and removed by the Khedive, with the consent of the British government. The country was to remain under martial law with the exception of Suakim. The slave traffic was prohibited, and the importation, sale, and manufacture of firearms and distilled liquors was to be restrained. On January 21 Lord Kitchener was appointed governor-general. The

newly acquired territory was divided into seven provinces, of which four were under purely military rule—namely, Omdurman, Fashoda, Senmar, and Kassala, and three were to retain their own administration—namely, Assuan, Wady-Halfa, and Suakim—these three having been continuously under Egyptian rule. Early in January Lord Cromer, the British diplomatic agent in Egypt, announced to an assembly of sheiks that henceforth they would be under the sovereignty of Great Britain, and that the sole representative of the Queen and of the Khedive was the Sirdar. The instrument of government vests in the governor-general absolute power in the administration of the Soudan, and gives him control over every kind of property situated in the region. It further states that no Egyptian law or decree shall apply to any part of the Soudan unless it be sanctioned by the governor-general. In the course of the debate on the address from the throne in the British Parliament, the government was taxed with having made the Soudan a part of the British Empire. Lord Salisbury replied that England's authority over the possessions of the Khalifa rested on two titles—namely, the fact of conquest and the fact that the Soudanese provinces were clearly a part of the Egyptian possessions. England had secured by conquest complete political power over the Soudan, and was heir to all the authority formerly possessed by the conquered power. There was much adverse comment in France upon this settlement of the affairs of the Soudan. The French accused the British government of bad faith, and declared that it had seized territories for itself under the pretense of regaining them for Egypt. In February, on the occasion of the introduction of a supplementary army estimate for additional expenditures, including among other things the cost of the Omdurman expedition, there was some sharp criticism of the government's forward policy in Egypt, and the Liberal leader, Sir H. Campbell-Bannerman, protested against the aggressive attitude marked by the operations in the Soudan. And when a motion was made pursuant to a request of the Queen that a sum not exceeding £30,000 should be granted to Lord Kitchener, there were some adverse comments on the latter's conduct in connection with the treatment of the Mahdi's tomb. The violation of that tomb, while admitted as in some degree justified as a preventive measure against fanaticism, was denounced as unworthy of a civilized power. It was defended by the government on the ground that to have allowed the tomb at Khartoum to become a focus of superstition would have imperilled the safety of the European officers who were left in command of the native troops. The military operations against the Dervishes continued during the early part of the year. Before the close of 1898—that is, on December 26—a battle was fought between a Soudanese regiment and one of the few remaining Dervish chiefs, resulting in the killing of 500 Dervishes and the capture of 1500 prisoners. The Khalifa, with a considerable body of followers, was still in the field, but the efforts to bring on a battle failed. Early in the autumn an expedition under the Sirdar found him at Jebel Gedir at the head of some 5000 men, but he fled without a battle. A little later a new expedition started out, and on November 25 the column under Colonel Wingate came up with the Khalifa's forces near Gedil, about 170 miles south of Omdurman, and won a complete victory, killing the Khalifa and his principal emirs, and taking some 9000 prisoners. Osman Digna, one of the ablest foes of England and Egypt, escaped capture, as he had done many times in the past. The overthrow of the Khalifa destroyed the last remnant of the Mahdi's power, and enabled the Sirdar to announce that "the Soudan may now be declared open."

Early in the year there was much discussion over England's supposed intention to increase the influence of Egypt by modifying the mixed tribunals. It will be remembered that in the interest of foreign powers, after the English occupation of Egypt, an international character was imparted to the tribunals, before which foreigners were brought to trial. The term of these courts was for five years, and they were renewable at the end of each five-yearly period. The British government proposed to the Khedive that they should be continued for only one year. France and Germany agreed to this, but on the understanding that the prorogation should not be repeated. The Egyptian government requested a renewal of the quinquennial arrangement, and this was granted, thus putting an end to all apprehensions in the matter. The important events in the industrial and commercial history of Egypt have been described in preceding paragraphs. For some discussion of the international aspects of Egyptian affairs, see the article FRANCE, which also contains an account of the convention of March 21, defining the limits of the two powers in the valley of the Upper Nile. See also GREAT BRITAIN; ARCHÆOLOGY; and ZOOLOGICAL STATIONS.

ELBERT, SAMUEL H., former governor of Colorado, died November 27, 1899. He was appointed governor of Colorado, then a Territory, in 1873. He was born in Ohio in 1833, graduated from Ohio University, practised law in Nebraska Territory, of whose legislative council he became a member in 1860, and in 1862 was appointed secretary of Colorado Territory for four years. He resumed the practice of law after the expiration of his term of office, and in 1875 was elected a judge of the Colorado Supreme Court.

ELECTRICAL ENGINEERING PROGRESS. The year 1899 was one of unprecedented prosperity in all branches of the electrical industry. While there was a substantial increase in the export trade in electrical machinery and supplies, the great bulk of the output was consumed in the United States. As indicating the extent of the electrical industry of this country, it may be noted that prominent authorities have estimated the total amount of capital employed in it at about \$3,250,000,000. Considerable progress has been made toward cheapening the development and transmission of electric current, and, aside from the field of pure invention, this will probably continue to be the direction of the greatest progress in electrical engineering for several years to come. In electric lighting a noteworthy development was recorded in the increased use of the long-burning, enclosed arc lamp for street lighting. Progress in electric power development was chiefly along the line of increased centralization through large plants operating with large units and in long-distance transmission of power. The use of aluminium for transmission lines in place of copper increased substantially during the year. The street railway service of the United States is now performed almost entirely by electric traction, and a very considerable development has been recorded during the year in electric motor vehicles for city cab and carriage traffic. In telegraphy the principal progress of a noteworthy character has been in telegraphing without wires. See the article **WIRELESS TELEGRAPHY**. The progress in telephony has been chiefly in the direction of a more extensive and general use of the telephone. See **ELECTRIC LIGHT AND POWER**; **ELECTRIC RAILWAYS**.

ELECTRICAL ENGINEERS, AMERICAN INSTITUTE OF, at the close of the fiscal year, April 29, 1899, reported a total membership of 1133, a net gain of 35. There were 5 deaths during the year, and 19 resignations were received. The treasurer's report showed a cash balance on hand of \$5068.38. The Institute holds monthly meetings at 12 West Thirty-first Street, New York City, and prints its transactions monthly. President, Arthur E. Kennelly, Philadelphia, Penn.; secretary, Ralph W. Pope, 26 Cortlandt Street, New York City.

ELECTRIC CARRIAGE. See **AUTOMOBILE**.

ELECTRIC ELEVATORS. See **ELEVATORS**.

ELECTRICITY used for thawing frozen water pipes. See **WATER-WORKS**.

ELECTRIC LIGHT AND POWER developments during the year have shown steady progress along established lines rather than marked departures in practice. The tendency has been consolidation, both of companies and of heretofore separate plants of the same company. In Brooklyn, for instance, a number of companies have combined recently and two immense generating stations have been built by the Edison Electric Illuminating Co., where three-phase current of 6600 volts is produced. One of these stations serves an area of 120 square miles, the current being transmitted by underground lines to ten sub-stations, from which points currents of different character, to suit the varied wants of consumers, are distributed, the current being changed by transformers to such lower voltages as may be required. By means of this plan central stations may be located at the most advantageous points for generating current, instead of near centres of distribution, thus effecting all the economies due to favorable sites, such as low ground rents and conditions favorable to receiving coal. In addition, all the latest devices for handling coal and ashes may be employed to greater advantage in large than in small stations. Whether the auxiliary power at such stations should be steam or electrical seems to be still an unsettled question. Where water-power instead of steam is used, the single, large generating station may be even more economical, and it is here that the recent developments in long transmissions, noted farther on, come into play. The generating station having been located in accordance with its particular needs, there is more freedom in the choice of sites for distribution stations.

Consolidations are not confined to electric lighting alone, but include both this and electric street railways. In fact, the tendency is for all plants furnishing light, heat, and power to come under one management, as witness the New York Gas, Electric Light, Heat, and Power Company, which controls by ownership six other light and power companies, and has an authorized capitalization of \$72,000,000, divided equally between stocks and bonds. The Monongahela Light and Power Company, with general offices at Pittsburg, Penn., now has plants at Braddock, Homestead, McKeesport, Duquesne, and Wilkinsburg.

The whole city of Buffalo began to be lighted by electricity from Niagara Falls in 1899, and during the year an extension of the great water-power electric plant at the Falls was begun, which will increase its capacity from 50,000 to 100,000 horsepower.

Long-distance transmission of electric current and high voltages are keeping pace with each other in their rapid increases in magnitude. Louis Bell, Ph.D., in the latest edition (1899) of his *Electric Power Transmission*, gives a table of facts

regarding over fifty lines in the United States and Canada operating at 10,000 volts or more, a number of them being over 25 miles in length. Eleven of these are operating at or above 20,000 volts. Nearly all the generators are of the two or the three-phase type, the cycles ranging from 25 to 133 per second, but generally being about 60. Dr. Bell says that "with well-designed glass or porcelain insulators of the quality now obtainable there is little danger of puncture or serious leakage up certainly to 20,000 volts. With the best commercial insulators, carefully tested previous to installation, even this very high voltage may be doubled without likelihood of serious trouble, provided climatic conditions are good."

The building of long transmission lines is due to the desire to make water-power available for lighting and power purposes in distant centres of population. The longest line of the sort yet built supplies current to Los Angeles, Cal., through a little over 80 miles of six No. 1 copper wires (about 9-32 inch in diameter). The water-power is developed from mountain streams east of San Bernardino, known as Santa Ana River and Bear Creek. The water is brought to the power house through about 2½ miles of tunnels and timber flumes, there being 18 tunnels, with a total length of 11,555 feet, the longest being 2074 feet, and 20 flumes, with a total length of 2662 feet. A 30-inch steel penstock supplies 82-inch Pelton impulse water wheels under an effective head of 723 feet, or 314 pounds per square inch. The wheels are direct-connected to four 750-kilowatt generators, running at a speed of 300 revolutions per minute and delivering current at 750 volts. This current is transformed to 33,000 volts for transmission. The capacity of the station early in 1899 was 4000 horse-power, but it can be increased to 6000 horse-power.

Alternating-current generators are rapidly replacing the direct type, the current, if desired, being changed subsequently at the distributing stations by means of rotary converters. In a few instances special transformers, devised by Elihu Thompson, have been installed recently to supply alternating arcs in series from a constant potential.

Storage batteries, or accumulators, are gaining in favor and use, accumulating current during hours of light load and delivering at the "peak" of the load, thus saving in cost of installation of the power plant as well as in operating expenses.

The use of enclosed arc lamps with alternating currents is still on the increase, as are also alternating arc lamps in series. Increased voltages for incandescent lighting are also being employed, going up to 220 or 440 volts.

The Nernst electric lamp has aroused great interest, but is still in the experimental stage. Alternating current is passed through a small rod of great insulating power at ordinary temperatures, but which gives a brilliant light at high temperatures. As the rod must be warmed independently by a match or otherwise before it can be lighted, a practical difficulty remains to be removed before its adoption on a commercial scale can be expected, besides which other practical difficulties exist.

The high price of copper during 1899 and the comparatively low price of aluminium has resulted in the use of the latter metal for several important transmission lines, one being at Snoqualmie Falls, Wash., and another at Hartford, Conn. At Hartford the price of copper wire was 19¼ cents per pound when the material for the line was bought against 15¼ cents per pound for the aluminium.

The number of central electric lighting stations under private ownership in the various States of the Union early in 1899 is given in the accompanying table:

Central Electric Lighting Stations in the United States Owned and Operated by Private Corporations, Firms, and Individuals. (From the American Electrical Directory for June 30, 1899.)

STATE.	Number of Central Stations.	Capital Stock.	NUMBER OF ARC LIGHTS.				NUMBER OF INCANDESCENT LIGHTS.			Engine Horse-Power.
			Series.	D. C. Inc.*	A. C. Inc.†	Total.	Direct.	Alternat-Ing.	Total.	
Alabama.....	21	\$1,755,700	2,634	68	49	2,751	7,665	21,810	29,475	7,155
Arizona.....	8	570,000	143	8	.....	151	2,500	7,900	10,400	1,435
Arkansas.....	25	1,492,900	911	111	81	1,103	9,585	15,265	24,850	4,860
California.....	85	27,968,000	10,206	1,027	323	11,556	159,210	208,998	368,070	59,510
Colorado.....	48	19,795,500	8,576	64	55	8,695	44,390	115,665	159,955	22,100
Connecticut.....	39	4,695,500	5,084	198	16	5,298	87,175	97,790	124,965	17,760
Delaware.....	1	250,000	200	.....	.....	200	12,500	10,000	22,500	1,200
District of Columbia.....	3	1,525,000	550	.....	.....	550	20,000	1,200	21,200	3,800
Florida.....	14	538,000	1,125	1	106	1,232	2,050	16,100	18,150	5,285
Georgia.....	24	2,245,500	2,682	16	816	3,014	4,000	54,350	58,350	11,515

* Direct current incandescent.

† Alternate current incandescent.

STATE.	Number of Central Stations.	Capital Stock.	NUMBER OF ARC LIGHTS.				NUMBER OF INCANDESCENT LIGHTS.			Engine Horse-Power.
			Series.	D. C. Inc.*	A. C. Inc.†	Total.	Direct.	Alternating.	Total.	
Idaho.....	12	\$330,000	297	.....	3	300	5,600	5,745	11,345	1,985
Illinois.....	208	19,684,550	16,238	4,274	493	21,005	312,465	449,838	762,303	77,865
Indiana.....	100	6,275,550	9,704	39	151	9,894	41,990	159,780	201,770	33,990
Indian Territory.....	1	10,000	.....	30	.....	30	1,000	.....	1,000	110
Iowa.....	114	6,900,500	4,887	371	166	5,424	53,385	155,678	209,063	30,680
Kansas.....	57	3,107,000	3,233	234	30	3,497	28,515	63,150	91,665	15,020
Kentucky.....	36	2,179,900	3,162	10	74	3,246	3,935	96,615	100,550	10,915
Louisiana.....	8	950,725	2,440	502	50	2,992	11,380	43,900	55,280	13,135
Maine.....	41	2,346,600	2,410	10	5	2,425	22,960	70,466	93,426	17,150
Maryland.....	24	4,087,000	4,563	148	15	4,726	10,800	71,900	82,700	14,235
Massachusetts.....	85	17,749,000	25,235	1,588	154	26,977	222,175	524,959	747,134	106,508
Michigan.....	106	6,219,575	8,251	1,028	322	9,601	117,453	237,655	355,108	38,355
Minnesota.....	47	4,884,000	4,400	364	13	4,777	64,085	99,460	153,545	17,840
Mississippi.....	13	1,786,500	620	12	10	642	2,100	14,450	16,550	2,570
Missouri.....	74	9,649,500	7,072	37	915	8,924	20,350	298,310	318,660	31,095
Montana.....	19	3,131,000	1,415	100	14	1,529	5,300	65,025	70,325	7,145
Nebraska.....	26	3,084,250	1,485	40	72	1,597	6,550	43,515	50,065	8,125
Nevada.....	4	310,000	185	.....	.....	185	.....	1,050	1,050	305
New Hampshire.....	44	3,382,500	3,070	40	21	3,131	12,940	99,020	111,960	17,445
New Jersey.....	65	7,176,450	9,315	79	156	9,550	58,775	175,680	234,455	34,925
New Mexico.....	5	400,000	62	.....	.....	62	1,000	4,400	5,400	700
New York.....	216	54,225,000	34,847	7,579	4,085	46,511	675,310	687,130	1,362,440	195,680
North Carolina.....	20	953,100	815	13	.....	828	5,905	14,850	20,755	2,195
North Dakota.....	6	425,000	110	22	.....	132	3,450	6,600	10,050	1,235
Ohio.....	136	11,634,000	18,926	882	225	20,033	175,960	225,606	411,566	57,515
Oklahoma Territory.....	5	280,000	240	.....	20	260	5,490	1,850	7,340	1,000
Oregon.....	28	4,560,000	1,891	14	14	1,919	5,370	43,325	48,695	10,605
Pennsylvania.....	225	18,197,035	31,239	1,473	623	33,335	361,346	595,760	957,106	122,365
Rhode Island.....	12	3,064,500	5,060	78	4	5,142	13,170	66,220	79,390	13,700
South Carolina.....	14	1,801,600	730	12	87	829	1,050	17,100	18,150	4,920
South Dakota.....	17	632,500	360	2	15	377	5,960	12,800	18,760	18,460
Tennessee.....	25	1,452,300	2,230	11	110	2,351	1,155	79,230	80,385	15,030
Texas.....	78	5,150,400	3,187	72	95	3,354	21,953	114,755	136,708	21,375
Utah.....	8	751,000	910	.....	50	960	1,150	14,600	15,750	4,060
Vermont.....	26	962,300	1,230	20	24	1,274	5,090	48,440	53,053	7,980
Virginia.....	31	1,461,500	2,067	92	68	2,227	18,100	24,995	43,095	7,850
Washington.....	33	3,887,800	2,335	55	10	2,400	25,285	33,100	58,385	15,855
West Virginia.....	31	1,102,600	775	30	21	826	7,640	39,900	47,540	5,910
Wisconsin.....	86	13,391,275	6,968	269	105	7,342	45,065	131,160	176,225	37,635
Wyoming.....	9	297,100	255	20	.....	275	9,250	3,975	13,225	1,590
Totals.....	2,390	\$279,704,610	250,230	21,043	9,166	280,439	2,679,432	5,380,932	8,060,364	1,159,788

* Direct current incandescent.

† Alternate current incandescent.

Allowing about the same rate of increase for public as for private plants, the total number of central stations early in 1899 would have been 2710. By the close of the year it is probable that the number had increased to 2800. Many cities, it should be remembered, have two or more central stations. There has been a strong movement for municipal ownership of electric lighting plants for a number of years past. Thus far Detroit possesses the largest plant of the kind, and Chicago is the largest American city in which municipal ownership has been tried. Only a part of Chicago is yet lighted by the city plant, but if the proposed plan of utilizing the water-power at the lower end of the drainage canal is carried out by the city, all the streets of Chicago may eventually be lighted from municipal works.

Some very practical points regarding city lighting contracts were brought out at the last meeting of the American Society of Municipal Improvements by Mr. D. Hunter, Jr., chairman of the committee on electric lighting. He suggested that the meter system be made the basis of charges for arc street lighting, instead of a fixed sum for lamps of 1200 or 2000 nominal candle-power, using 330 or 480 watts, respectively, burning a certain number of hours. Under the old system a city rarely knows just what it is getting, the candle-power often running low and there being many outages. With the meter system the company would be anxious to maintain a full, constant current, as its remuneration would be increased thereby.

ELECTRIC STREET RAILWAYS are now in the decided majority in the United States, as is shown by the accompanying table. Of 1121 street railways in operation early in 1899, 966 were electric and the remaining 155 were divided as follows: Horse, 103; steam, 31; cable, 21. It is expected that the cable roads will soon disappear entirely; likewise all but the short, unimportant horse railways where local conditions do not warrant the installation of power stations. About one-fourth of all the horse

STATISTICS OF TRACK MILEAGE, CAPITALIZATION, AND CAR EQUIPMENT OF STREET RAILWAYS IN THE UNITED STATES.
(From *American Street Railway Directory* for May 31, 1899.)

STATES	NUMBER OF ROADS			Capital Stock	Bonds	TRACK MILEAGE			CARS				Steam Locomotives	Horses and Mules			
	Elec.	Cable Steam Horse				Total	Elec.	Cable Steam Horse		Total	Motor	Trail			Cable Steam Horse		Total
Alabama.....	8	5	13	\$4,648,000	\$2,567,000	112.90	90.38	8.96	212.26	142	84	74	316	54			
Arizona.....	1	1	2	No report	No report	6.50			9.50	7	38		132	118			
Arkansas.....	4	1	5	1,265,000	847,000	71.75	18.30		90.06	57	5		182	46			
California.....	26	4	30	19,685,000	9,733,000	558.12	115.87	12.04	822.07	732	183	286	1,878	874			
Colorado.....	7		7	9,650,000	9,500,000	180.10	30.00	10.50	246.00	241	64	4	574	8			
Connecticut.....	25		25	9,479,440	9,065,800	434.46			434.46	819	85		1,034	10			
Delaware.....	5		5	464,112	600,000	40.35			40.35	69	18		107				
District Columbia.....	11	1	12	18,352,000	6,686,800	175.64	6.00	12.80	185.64	444	43	44	909	150			
Florida.....	15	9	24	6,351,000	354,000	49.50		9.00	64.50	55	20	10	99	5			
Georgia.....	12	2	14	8,800,000	8,680,000	288.75		11.00	250.75	287	86	67	404	2			
Idaho.....	1		1	300,000		3.50			3.50	2			2				
Illinois.....	51	5	56	128,758,000	64,710,000	1,094.05	59.17	11.25	1,911.80	2,811	1,892	385	4,615	294			
Indiana.....	23	3	26	10,595,000	9,475,000	288.85		9.00	967.25	728	262	4	748	49			
Iowa.....	21	1	22	13,280,000	4,669,000	298.28	7.00	6.96	1,993.51	330	168	18	1,539	46			
Kansas.....	7	4	11	8,490,000	2,448,000	107.55			129.05	92	107		192	118			
Kentucky.....	12		12	11,975,000	12,432,000	293.80		16.00	978.80	483	386	10	762	120			
Louisiana.....	12	1	13	12,190,000	9,108,400	191.98		6.00	978.80	483	386	51	954	7			
Maine.....	1	1	2	4,821,075	2,448,000	203.72		3.00	905.92	341	58	20	453	17			
Maryland.....	16	1	17	38,264,800	36,270,000	242.19	21.00		343.95	210	107	74	401	1			
Massachusetts.....	98		98	33,000,000	15,523,600	1,642.19		3.30	1,642.38	5,254	310	1	5,477	18			
Michigan.....	81	2	83	13,268,000	14,200,400	309.58		5.00	1,662.37	1,199	311	7	1,346	2			
Minnesota.....	6		6	12,780,000	12,268,500	355.63		12.00	910.63	688	307	2	1,081	3			
Mississippi.....	4		4	12,670,000	4,400,000	311.10		13.00	84.00	68	10		81	31			
Missouri.....	34	8	42	38,643,800	39,491,000	685.14	104.30	14.75	947.07	1,945	734	649	2,638	4			
Montana.....	5		5	1,720,000	2,346,000	131.24			31.64	46	80		170				
Nebraska.....	10	4	14	1,435,000	2,410,000	123.73		18.50	148.25	233	215	11	473	36			
New Hampshire.....	1	1	2	1,475,000	39,000,000	14.30		8.00	185.38	141	43		191	1			
New Jersey.....	30	1	31	47,622,000	39,000,000	618.68	1.80	19.43	632.81	1,377	147	2	1,735	32			
New York.....	102	5	107	311,582,000	107,801,100	1,970.28	55.25	307.54	2,944.65	1,847	734	1,668	11,030	9,903			
North Carolina.....	1		1	1,070,000	586,000	36.14			37.64	60	8		76	8			
Ohio.....	70	1	71	70,696,000	32,496,000	1,492.96	26.00	6.00	1,521.56	2,451	384	6	3,153	6			
Oregon.....	1		1	2,035,000	1,115,600	115.60	77.00	4.50	199.68	137	41	16	221	4			
Pennsylvania.....	172	1	173	325,560,000	108,700,830	1,898.85	40	14.50	1,906.68	5,238	382	5	5,698	17			
Rhode Island.....	8		8	10,325,000	700,800	169.85			169.85	87			596				
South Carolina.....	3		3	2,040,000	2,665,000	51.00		6.35	56.35	65	43		126	38			
South Dakota.....	2		2	100,000					11.00				9				
Tennessee.....	18	1	19	4,977,000	6,067,000	187.04	1.68	28.50	215.07	388	107	7	444	44			
Texas.....	91	2	93	6,353,000	1,814,000	964.43		44.00	308.43	103	6	150	653	6			
Utah.....	4	1	5	1,050,000	977,000	91.83	10.00	4.00	105.83	101	21	4	130	8			
Vermont.....	10		10	1,310,000	881,800	98.50			93.50	65	8		73				
Virginia.....	17		17	8,965,000	4,965,000	188.87	8.50		202.87	384	44	5	383	1			
Washington.....	31	5	36	12,043,000	6,596,000	992.13	30.04		819.17	241	70	89	307	4			
West Virginia.....	6	1	7	1,060,000	731,000	54.50	7.85	3.00	63.75	109	11		145				
Wisconsin.....	20		20	11,335,000	2,837,000	288.70			898.70	168	107		688				
Totals.....	966	31	997	\$1,020,930,027	\$508,434,230	15,014.47	685.68	620.54	17,708.17	84,401	8,087	3,374	50,529	11,888			

lines are in New York State, including also one-third of the mileage and 9863 of the 11,888 horses reported for the whole country. Deducting the New York State figures from the total, we have 80 lines, 400 miles of track, and 2025 horses for the rest of the country, or 5 miles of track and 25 horses per line. The bulk of the New York State mileage is in the Manhattan borough of the city of New York, and will soon give way to electric traction. Further progress, with changes from horse to electric lines, outside of New York City, will be comparatively slow for the reasons already stated. The figures for street railways operated by steam will also show a great falling off soon with the adoption of the third-rail electric system for the Manhattan Railway Company of New York. This company and the Brooklyn Elevated Railroad Company together have 113 miles of track and 433 locomotives out of the 620 miles of track and 614 locomotives shown in the table for steam lines. The total capitalization of the street railways of the United States was nearly \$1,600,000,000 when the table was compiled, but the figures are not given separately for the different classes of roads.

Dismissing from further consideration here all street railway lines except surface electric (see RAPID TRANSIT), it may be noted first that the overhead trolley continues to be almost universally employed in this country, outside of New York (Manhattan borough) and Washington. In New York the open-slot underground conduit system is being extended with rapidity, and in Washington nearly the whole city mileage is so equipped. Abroad the overhead system continues to be the one generally employed, the city of Glasgow, after a careful investigation, adopting it for its new electric railways in preference to the conduit system. Feeder wires, however, for the new lines of large railways with their immense high-tension current-generating stations are being placed underground. In road-bed construction permanence and stability are kept prominently in view. Some incline to the substitution of concrete beams or blocks for wooden ties, but this has by no means become an established practice. Cast-welded joints are being made with apparent success, and electric-welded joints are still being tried here and there. As a matter of good engineering practice, and because of the pressure brought to bear by the officials of municipalities and gas and water companies, increasing attention is being given to the bonding of rail joints to the end that the current may return to the power house through the street railway system, instead of through gas and water mains. The officials just named are vitally interested in this matter on account of its relation to electrolysis of gas and water mains, which may lead to their failure, with most serious results. Where the cast or electric-welded joints are not used the rail joints are bonded with copper wire.

An overhead trolley at one side, instead of over the centre of the car, was recently substituted for a conduit system at Blackpool, England. The side trolley was used to lessen the disfigurement of the streets by overhead construction, only one line of poles being required. The conduit system was abandoned because sand drifted into it in dry weather and water entered it at other times, the road being along a beach.

Trials were made in 1898 and 1899 of a through transportation system on country roads and electric street railways. The system was invented by Joseph C. Bonner, of Toledo, O., and was first tried in that city during the latter part of 1898. Heavy wagons, of three to seven tons carrying capacity, fitted with wide tires, are shifted at transfer points to special street railway trucks, the trucks being run under the wagon, the wheels of the latter extending down nearly to the ground, outside the truck wheels. One or more of these loaded trucks are hauled by a motor car, bringing in commodities from the country districts or the villages traversed by suburban lines. The wagons are hauled to the loading or transfer points by the farmers or others making use of them, and are provided for at the other end by the company owning the special trucks. The service at Toledo was not continued long, partly because there was not enough business to warrant it; but on January 1, 1899, the system was put on trial between Detroit and Pontiac, Mich., which are some 25 miles apart. Three wagons were used and two trains ran each way daily. In Ireland the Bessbrook and Newry Electric Railway is used for ordinary wagons, as well as motor cars, the wagons being brought to and taken from the line by horses and being attached to the cars while in transit on the railway. The line is 3 miles long, rises 180 feet, and has a 3-foot gauge. The track is of steel T-rails, with a lower line of steel rails just outside the T-rails, on which the wagon wheels run. The road cost about \$78,000. It has been operated for 16 years, and is mentioned in conjunction with the Toledo and Detroit experiments to show another method of attaining the same general end.

An automatic block system for single-track electric railways, using turnouts for cars going in opposite directions, was put in operation late in 1898 by the Lowell (Mass.) Suburban Electric Railway. Each car as it advances into a block (the length of track between turnouts) cuts off the current from a section of the trolley wire on the turnouts at each end of that block, so no other car can enter until that

one leaves the block. When the car leaves one block it restores the current to its turnouts and cuts out the current from the next set of turnouts.

Of the notable accidents caused by electric cars running away since the introduction of electric traction, the following may be mentioned. Where fatalities resulted the deaths ranged from 1 to 18, the latter number being killed at Cohoes, N. Y., on September 5, 1898. The greatest number of persons recorded in the list as injured was 66, at Lawrence, Mass., on August 11, 1892, there being a couple of deaths in addition. The number of injuries in the Cohoes accident was 12. The worst electric railway accident in 1899 was near Bridgeport, Conn., on August 6, when 29 persons were killed and a dozen or more seriously injured by a car leaving the rails as it was going onto a trestle, running some 80 feet on the ties and plunging down, striking bottom side up, the heavy motors crashing through the floor and adding to the death and injury. As the car ran 80 feet on ties, proper guard rails would doubtless have prevented the accident. The car, it is said, was running at a high rate of speed down a 3 per cent. grade just before it reached the trestle. Other accidents in 1899 showed the need of the more extensive use of power brakes, instead of relying on hand brakes alone. Progress in this line until quite recently has been very slow, owing to the newness of the field and the expense involved. Even now it costs from \$150 to \$200 to equip a single car with power brakes, but the yearly capital and operating charges on equipments at this rate are insignificant compared with the damages to life and property caused by a single bad accident. Air or electric brakes are being introduced in this country, but only a beginning has been made compared with the progress abroad, where the municipal authorities are generally quite rigid in their requirements regarding safety devices.

A feature of German practice that may be mentioned is the use of the overhead trolleys in the suburbs and storage batteries in the densely populated districts, the batteries being carried as dead weights in the suburbs and charged from the lines before leaving the overhead system. Thus far the only important line employing storage batteries in this country is the Chicago Electric Transit Company, which for about two years has operated storage-battery cars over some 25 miles of track.

What will be the largest electric railway power station in the world is now being built by the Third Avenue Railroad Company at Two Hundred and Sixteenth Street and Ninth Avenue, New York. There will be 16 Westinghouse vertical, cross-compound condensing engines, with generators mounted on the shaft between the cylinders. Each engine will be of about 4500 horse-power normal capacity, making a total of 72,000 horse-power, which can be raised to a maximum of 100,000 horse-power or more. There will be 60 Babcock and Wilcox water-tube boilers, adapted for 200 pounds pressure, placed in two tiers. All the coal will be handled by machinery from the boats to the furnaces, and the ashes will be handled in like manner. The chimneys or smoke-stacks will have a total height of 200 feet above the lower boiler-room floor. There will be 4 stacks of brick for the first 102 feet, then of riveted steel courses for 98 feet, the steel portion being self-supporting, 12 $\frac{3}{4}$ feet in diameter, lined with brick. The chimney draughts will be supplemented by 8 large exhaust fans. There will be as many electric generators as engines (16), since they are of the direct-connected type. The current will be distributed to the lines from five or more transformer sub-stations. This big station extends from Two Hundred and Sixteenth to Two Hundred and Eighteenth Street and from Kingsbridge Road to the Harlem River dock, its outside dimensions being 246 x 325 feet. About 15,000 piles, 40 feet long, 2 $\frac{1}{2}$ feet centre to centre, were driven for the foundation, around and above which will be 7 to 8 feet of concrete. Dr. Louis Duncan is chief engineer of the Third Avenue Railroad Company. Of scarcely less interest than the 72,000 horse-power (normal) power station of the Third Avenue lines is the station of the Metropolitan Street Railway Company, also of New York, with a normal capacity of 45,000 horse-power and a possible maximum of 75,000 horse-power for short periods. It will contain 87 Babcock and Wilcox boilers, arranged in three tiers and having an aggregate maximum capacity of 69,400 horse-power; 11 Allis engines, with an economic horse-power of 4000 each, direct connected to three-phase generators, furnishing currents of 6000 volts. The power house is 201 x 279 feet, occupying the block bounded by First Avenue, the East River, Ninety-fifth and Ninety-sixth Streets. This station, like the Third Avenue, has a pile and concrete foundation, the concrete being 5 feet deep. One of the largest brick chimneys ever built will serve the station. It has a total height of 353 feet, and rests on a solid block of concrete 85 $\frac{1}{2}$ x 88 feet in area and 20 feet deep. The first 15 feet of the chimney in height is pyramidal in plan, with the corners cut off, diminishing from 55 feet square to 40 feet. In the next 65 feet, or at a point 80 feet high, it diminishes to a square of about 39 feet, where it begins to change to a circular section, attaining such a section at the 95-foot point. It continues circular in section to the top, tapering $\frac{1}{8}$ inch per foot of height, until at 317 feet above the ground it is 26 feet in outside diameter. Here the ornamental

top begins, extending on to the full height of 353 feet. Mr. M. G. Starrett is chief engineer of the Metropolitan Street Railway Company.

A struggle for municipal ownership of the street railways of Detroit attracted great attention throughout the country in 1899. The movement was defeated by a court decision to the effect that the constitutional prohibition of the use of State funds for internal improvements in Michigan made it illegal for a city to construct street railways, since the legislature could not authorize a city to do what the State itself was not allowed to do. After this decision a plan was set on foot to have the street railways acquired by a company organized in the interests of the city, but this was finally dropped. A commission appointed by the city estimated the value of the unexpired portions of the various street railway franchises at an aggregate of \$8,000,000, or about the same as the value of the physical plant. An article by Mr. Edward E. Higgins, published in the *Street Railway Journal* for October, 1899, entitled *Financial Characteristics of the Large City Transportation Systems of the World*, presents statistics for 30 cities and centres of population of 500,000 or more, including all but eight of such centres in the world. The table includes the mileage of track, passengers carried, car miles run, capitalization, gross receipts, and operating profits, most of these several heads being subdivided. The figures presented are ably discussed by the author. See ELECTRIC LIGHT AND POWER; RAPID TRANSIT.

ELECTROLYSIS. See WATER-WORKS.

ELECTRO-THERAPEUTIC ASSOCIATION, AMERICAN, held its ninth annual meeting in Washington, D. C., September 19-21, 1899, under the presidency of Dr. F. B. Bishop, of Washington. Officers elected: President, Francis B. Bishop, M.D., Washington, D. C.; secretary, John Gerin, M.D., Auburn, N. Y.

ELEMENT. See CHEMISTRY.

ELEVATED RAILWAYS. See RAPID TRANSIT (paragraph Elevated Railway).

ELEVATORS. The modern steel skeleton tall building of America owes its possibility very largely to the development of the high-speed passenger elevator. Without this means of transportation the upper floors of such buildings would be practically useless. In some of the great New York and Chicago tall buildings the number of passengers carried each day by elevators numbers into the tens of thousands. To carry this traffic rapidly, safely, and cheaply, plainly requires an exercise of mechanical ingenuity in the elevator design and construction which is of no mean proportions. American elevator practice excels that of any other country, and some of the most notable elevator installations in foreign countries have been made by American manufacturers of this apparatus. See TALL BUILDINGS.

The modern high-speed passenger elevator is usually operated by hydraulic or electric power, and it consists (1) of a rectangular car which moves up and down between guides in a shaft or well having door openings into each floor, and (2) of the mechanism necessary to give this car its up and down movement. Such elevators are usually designed to run at a maximum speed of 600 feet per minute, but may be run at any less speed the operator may desire. Safety from accident is provided for in various ways. Broadly considered, modern elevator safety devices may be divided into two classes: (1) Clutch devices, which are thrown into operation when the car exceeds a certain speed, and stop the car by seizing hold of or gripping guides fastened to the walls of the elevator shaft, and (2) air-cushion devices, whose purpose is to break the shock of a falling car so that injury will not result to its passengers. Elevator safety grips are of various forms, and the successful ones are nearly all owned or employed by the firms which build elevators. The general principle upon which these devices operate is nearly the same, whatever their individual forms may be. A governor is placed on the elevator car whose speed varies with the speed of the car. When a certain speed is exceeded this governor actuates a mechanism which throws the clutch into operation. The older and most commonly used form of air-cushion consists essentially of making the lower portion of the elevator shaft tight so that the car falling into it acts as a piston in a cylinder, and is brought to a slow stop by the compression of the confined air. In one of the largest installations of this form of air-cushion, the closed shaft begins at the third story and is 50 feet deep. The total travel of the car is 287 feet, which makes the ratio of the depth of the air-cushion to the distance of travel as 1 to 5.74. In a display test, which was made with the cushions, a car weighing 2000 pounds was allowed to drop the total 287 feet, and it came to a complete stop without breaking eggs and incandescent electric lamp bulbs, which were placed on the floor of the car. A more recent form of air-cushion, which was first brought prominently to public attention in 1899, has the air-cushion at the top of the shaft. In this arrangement the car carries two grips, the jaws of which in normal operation encircle but slide loose over two steel cables provided with buttons. These cables are attached

at their tops to a yoke, which is carried by a piston rod and piston working in a vertical steel cylinder placed on the roof of the shaft. Normally the piston is held at the top of the cylinder by a spring-latch. When the car falls the governor first operates a clutch which opens the latch, and secondly, it operates the grips which close on the button ropes. This throws the weight of the car into the yoke and piston, which, sliding down in the cylinder, compresses the contained air, and brings the car to a gradual stop. As indicating the nature and size of some of the elevator installations in tall buildings, the following figures are of interest: Monadnock Block, Chicago, 16 hydraulic elevators, all of 16-stories travel; St. Paul Building, New York, 6 hydraulic elevators, two 25-stories travel, two 16-stories travel, two 9-stories travel; Bowling Green Building, New York, 9 hydraulic elevators, 16-stories travel; Ivins Syndicate Building, New York, 15 electric elevators, five 25-stories travel, and five 26-stories travel, one freight 26-stories travel, and two tower and two sidewalk elevators. The St. Paul Building elevator plant is a good example of express elevator service. Two of the elevators in this building travel to the ninth floor, stopping at every floor; two travel to the sixteenth floor, stopping at every floor above the ninth, but passing "express," or without stopping at floors one to nine; two travel to the twenty-fifth floor, running "express" to the sixteenth floor and "local" above that floor. An elevator plant of from four to six elevators requires a boiler-power of from 500 to 600 horse-power to operate them, and will cost to install from \$25,000 to \$40,000. For grain elevators see that title.

ELGAR, EDWARD, English composer, who attracted attention in 1899, was born in Broadheath, Worcestershire. He was educated privately, studied the violin and organ, became organist of St. George's Church, Worcester, and subsequently settled in Malvern. His compositions include: *The Black Knight*, cantata, 1892; *From the Bavarian Highlands*, a choral suite, Worcester Festival, 1896; *King Olaf*, 1896; *Imperial March*, 1897; *Banner of St. George*, 1897; *Te Deum*, Hartford Festival; and *Caractacus*, Leeds Festival, 1898. His works produced in 1899 were excellent: A symphony entitled *Gordon*, inspired by the career of General Gordon, was written for the Worcester Festival; *Sea Pictures*, for the Norwich Festival; and his *Symphonic Variations* were heard under Dr. Richter's baton in London.

ELLERBE, WILLIAM HAZELDEN, governor of South Carolina, died of consumption at his home in Marion County, June 2, 1899, after an illness of four months. He was born in Marion County, S. C., April 7, 1862. After studying at Pine Hill Academy he entered Wofford College, Spartanburg, in 1880; here he remained until 1882, when he went to Vanderbilt University, Nashville. He was soon obliged however, to relinquish his studies on account of ill health. He became a farmer, but entered politics, and in 1890 was elected comptroller-general on the ticket headed by the present United States Senator, Benjamin R. Tillman. In 1896 Mr. Ellerbe effected a union of the opponents and the more moderate followers of Mr. Tillman; and he himself, as a representative of conciliation, was nominated for governor and was elected by a large majority. The very fact that he was elected by combining factions made his position difficult, and during his term he made many enemies; his opponents, therefore, were for the most part united in the campaign of 1898, giving their support to the Prohibition candidate. Mr. Ellerbe was re-elected, however, but by a small majority. The week of the November election of 1898 was marked in some parts of the State by violent anti-negro demonstrations; Governor Ellerbe was condemned by many for tardiness in exercising executive authority for the quelling of the riots.

ELLIS, THOMAS EDWARD, Liberal member of Parliament, for Merionethshire, died April 5, 1899. He was born in Wales in February, 1859; was educated at the University College of Wales and at New College, Oxford. Mr. Ellis took an active part in educational and other public questions of Wales. He entered Parliament in 1896, and in 1895 was made chief whip of the Liberal opposition. He published *Public Education in Cheshire* and was joint-author of *A Hand-book of Intermediate and Technical Education for Wales*.

EMBRYOLOGY. See ZOOLOGICAL LITERATURE (paragraph Text-books).

ENGINEERING. See BRIDGES, CANALS, ELECTRIC STREET RAILWAYS, TALL BUILDINGS, and other articles on engineering topics.

ENGLAND. See GREAT BRITAIN.

ENGLAND, CHURCH OF, the "established church" of Great Britain, having the Queen as supreme governor, included in 1899 2 archbishops, 32 bishops appointed by the sovereign, 23,000 ministers, and 6,002,000 church-sittings. The doctrines of the church are in the hands of the Houses of Convocation, and temporal affairs are controlled by the house of laymen.

Church Officers.—

Bishops of the Anglican Communion.

THE CHURCH OF ENGLAND.

PROVINCE OF CANTERBURY.

See.	Income. £	Bishop.	Cons.	Trans.
Canterbury.....	15,000	Frederick Temple, D.D., Lord Archbishop, Primate of all England and Metropolitan.....	1869	1896
		William Walsh, D.D., Bishop-Suffragan of Dover.....	1861	1897
London.....	10,000	Mandell Creighton, D.D., D.C.L.....	1861	1896
		A. Earle, D.D., Bishop-Suffragan of Marlborough.....	1868	.....
		T. E. Wilkinson, D.D., Assistant Bishop, for British Subjects in Northern and Central Europe.....	1866	.....
		A. F. Winnington-Ingram, D.D., Bishop-Suffragan of Stepney.....	1897	.....
Winchester.....	6,500	C. H. Turner, D.D., Bishop-Suffragan of Islington.....	1896	.....
		Randall Thomas Davidson, D.D.....	1891	1895
		Hon. and Rt. Rev. A. T. Lyttelton, M.A., Bishop-Suffragan of Southampton.....	1898	.....
Oxford.....	5,000	William Stubbs, D.D.....	1864	1889
		James Leslie Randall, D.D., Bishop-Suffragan of Reading.....	1890	.....
St. David's.....	4,500	John Owen, D.D.....	1897	.....
		Bishop-Suffragan—John Lloyd, D.D., Bishop of Swansea.....	1890	.....
Llandaff.....	4,300	Richard Lewis, D.D.....	1883	.....
Norwich.....	4,500	John Sheepshanks, D.D.....	1898	.....
		A. T. Lloyd, D.D., Bishop-Suffragan of Thetford.....	1894	.....
Bangor.....	4,300	Watkin Herbert Williams, M.D.....	1898	.....
Worcester.....	5,000	John James Stewart Perowne, D.D.....	1891	.....
		E. A. Knox, D.D., Bishop-Suffragan of Coventry.....	1894	.....
Gloucester.....	5,000	Charles John Ellcott, D.D.....	1863	.....
		S. E. Maraden, D.D., Assistant Bishop.....	1892	.....
Ely.....	5,500	Lord Alwyne Compton, D.D.....	1896	.....
Rochester.....	4,500	Edward Stuart Talbot, D.D.....	1895	.....
		H. W. Yeatman, D.D., Bishop-Suffragan of Southwark.....	1891	.....
Lichfield.....	4,300	Augustus Legge, D.D.....	1891	.....
		Sir L. T. Stamer, Bt., D.D., Bishop-Suffragan of Shrewsbury.....	1888	.....
Hereford.....	4,300	J. Percival, D.D.....	1895	.....
Peterborough.....	4,500	Edward Carr Glyn, D.D.....	1897	.....
		F. H. Thicknesse, D.D., Bishop-Suffragan of Leicester.....	1888	.....
Lincoln.....	4,500	Edward King, D.D.....	1885	.....
Salisbury.....	5,000	John Wordsworth, D.D.....	1885	.....
Southwell.....	3,500	George Ridding, D.D.....	1894	.....
		Edward Ash Were, D.D., Bishop-Suffragan of Derby.....	1889	.....
Bath and Wells.....	5,000	George Wyndham Kennion, D.D.....	1892	1894
Exeter.....	4,300	Edward Henry Bickersteth, D.D.....	1895	.....
		R. E. Trefusals, D.D., Bishop-Suffragan of Crediton.....	1897	.....
Truro.....	3,000	John Gott, D.D.....	1891	.....
Chichester.....	4,200	Ernest Roland Wilberforce, D.D.....	1882	1896
St. Albans.....	3,100	John Wogan Festing, D.D.....	1890	.....
		H. F. Johnson, LL.B., Bishop-Suffragan of Colchester.....	1894	.....
St. Asaph.....	4,300	Alfred George Edwards, D.D.....	1889	.....
Bristol.....	3,000	George Forrest Browne, D.D., D.C.L.....	1895	1897

PROVINCE OF YORK.

See.	Income. £	Bishop.	Cons.	Trans.
York.....	10,000	William Dalrymple MacLagan, D.D., Lord Archbishop, Primate of England and Metropolitan.....	1878	1891
		R. J. Crosthwaite, D.D., Bishop-Suffragan of Beverley.....	1889	.....
		R. F. L. Blunt, D.D., Bishop-Suffragan of Hull.....	1891	.....
Durham.....	7,000	Brooke Foss Westcott, D.D.....	1890	.....
		D. F. Sandford, LL.D., Assistant Bishop.....	1890	.....
Chester.....	4,300	Francis John Jayne, D.D.....	1888	.....
Carlisle.....	4,500	John Wareing Bardsley, D.D.....	1897	1892
		Henry Ware, D.D., Bishop-Suffragan of Barrow-in-Furness.....	1889	.....
Manchester.....	4,300	James Moorhouse, D.D.....	1878	1886
		F. A. R. Cramer-Roberts, D.D., Assistant Bishop.....	1887	.....
Liverpool.....	4,300	John Charles Ryle, D.D.....	1890	.....
		P. S. Royston, D.D., Assistant Bishop.....	1873	1892
Newcastle.....	3,537	Edgar Jacob, D.D.....	1895	.....
Ripon.....	4,300	William Boyd Carpenter, D.D.....	1884	.....
		J. J. Pultine, D.D., Bishop-Suffragan of Richmond.....	1888	.....
Wakefield.....	3,000	George Rodney Edm.....	1890	1897
Sodor and Man.....	1,540	Norman D. J. Straton, D.D.....	1892	.....

THE CHURCH OF IRELAND.

PROVINCE OF ARMAGH.

See.	Income. £	Bishop.	Cons.	Trans.
Armagh.....	2,500	William Alexander, D.D., LL.D., D.C.L., Lord Archbishop, Primate of all Ireland and Metropolitan.....	1897	1896
Meath.....	1,500	J. B. Keene, M.A.....	1897	.....
Clogher.....	1,140	Charles Maurice Stack, D.D.....	1896	.....
Derry and Raphoe.....	2,000	George Alexander Chadwick, D.D.....	1896	.....
Down, Connor and Dromore.....	1,500	Thomas James Welland, D.D.....	1892	.....
Kilmore, Elphin and Ardagh.....	1,300	A. G. Elliott, D.D.....	1897	.....
Tuam, Killybegs and Achonry.....	.....	James O'Sullivan, D.D.....	1890	.....

PROVINCE OF DUBLIN.

See.	Income. £	Bishop.	Cons.
Dublin, Glendalough and Kildare.....	.....	J. F. Peacocke, D.D., Lord Archbishop, Primate of Ireland and Metropolitan.....	1894
Cashel, Emly, Waterford and Lismore.....	1,125	Maurice Fitzgerald Day, D.D.....	1872
Cork, Cloyne and Ross.....	1,170	W. E. Meade, D.D.....	1894
Killaloe, Kilfenora, Clonfert and Kilmacduagh.....	1,500	Mervyn Archdall, D.D.....	1893
Limerick, Ardferit and Aghadoe.....	2,375	T. Burnaby, D.D.....	1899
Ossory Ferns and Leighlin.....	1,500	J. B. Crozier, D.D.....	1897

BISHOPS OF THE ANGLICAN CHURCH IN SCOTLAND.

See.	Bishop.	Cons.
Brechin.....	Hugh W. Jermyn, D.D., <i>Primus</i>	1875
Moray, Ross and Caithness.....	J. B. K. Kelly, D.D., D.C.L.....	1867
Aberdeen and Orkney.....	Hon. A. G. Douglas, D.D.....	1883
Argyll and the Isles.....	J. R. A. C. Haldane, LL.B.....	1883
Edinburgh.....	John Dowden, D.D.....	1886
Glasgow and Galloway.....	W. T. Harrison, D.D.....	1888
St. Andrews, Dunkeld and Dunblane.....	G. H. Wilkinson, D.D.....	1883

Ritualistic Controversy.—The controversy between the high church Romanizing element in the Church of England and the low church, which began in 1898, was continued in 1899, the Archbishop of York's letter of December, 1898, regulating various ritualistic observances. In January, 1899, a meeting of high church clergy took place, and in the same month a mass meeting was held in London to protest against the Romanizing of the Anglican Church. In February the English Church Union met and protested against the interference of Parliament in matters of religious doctrine and ceremonial. An inquiry was held before the Archbishops of Canterbury and York in May into the rights of clergymen to use incense and processional lights, and it was found by the archbishops that the Book of Common Prayer and the canons of the church gave no authority for the use of either processional lights or incense during services, though it did not prescribe against the burning of incense before services to sweeten the church. This decision, though most unwelcome to the high church element, was accepted by clergymen generally. The subject of confession was taken up by press and Parliament, and in the latter resolutions were passed deploring the lawlessness shown by certain clergymen, and recommending that, if the bishops could not succeed in making the clergy conform to the canons in the matter of church ritual, further legislative enactments were to be considered necessary.

ENTOMOLOGY. The year 1899 was not productive of any extraordinary discovery or any unusually notable piece of work in the field of entomology. The systematic entomologists have been very active, as in preceding years, and about 3000 new species of insects have been described, about three-quarters of the number described in 1898. As might be expected, the butterflies and moths and the beetles

contribute the bulk of the new species. Perhaps the most interesting and important investigations carried on in entomology during the year have been those dealing with the relation of mosquitoes and malaria. These have been carried on in Italy, Africa, and India, under the auspices of the Royal Society, and with the assistance of the British government. Although the investigations are undertaken from the medical point of view, and come under that head more properly, they have an important entomological bearing. So far the investigations have not shown conclusively that malaria in man is wholly due to mosquitoes. Several methods for the destruction of mosquitoes have been tried in India. Draining marshy areas has proved successful, and throwing kerosene on the water has also been effective, but the most satisfactory results are promised by the use of permanganate of potash, a chemical also effective against the cholera bacillus. See *MALARIAL FEVER AND MOSQUITOES*.

In the United States, economic entomology is each year occupying a more important position, and the Society of Economic Entomologists is now one of our important scientific societies. The eleventh annual meeting was held at Columbus, O., August 18, 1899, just preceding the meetings of the American Association for the Advancement of Science. The address of the retiring president, Mr. C. L. Marlatt, was on *The Laissez-faire Philosophy Applied to the Insect Problem*. The position was taken that the introduction of new forms are world movements, not to be thwarted by man, and that the only legitimate field for efforts in applied entomology is the local control of injurious species. Mr. Marlatt regards the efforts to exterminate foreign insects once established as futile. In spite of this address, however, resolutions were adopted endorsing the work of the Massachusetts Gypsy Moth Commission and the quarantine work of the California State Board of Horticulture. Some two dozen papers were presented by a dozen different workers. The annual meeting of the Entomological Society of London was held on January 18, 1899, and the address by the president, Roland Trimen, F.R.S., was on *Seasonal Dimorphism in Lepidoptera*. The literature of this remarkable phenomenon was thoroughly reviewed, and numerous observations of the speaker and his correspondents were recorded, but no theoretical conclusions were drawn, as the body of facts is at present too small to warrant any far-reaching deductions. Some very interesting facts were stated, showing that certain butterflies, which had been described as distinct species, were in reality only varieties due to the season of the year when captured. Another very important address relating to insects was delivered the same evening, January 18, in Washington. It was the address of the retiring president of the Biological Society, Mr. L. O. Howard, and the title was *The Economic Status of Insects as a Class*. The injurious and beneficial work of insects is dealt with in detail, but the author leaves us in doubt as to whether the sum total of one overbalances the other or not. He finds that insects are injurious in five ways: As destroyers of valuable plants; as destroyers of stored food, clothing, dwellings, books, etc.; injuring useful animals; annoying man, and carrying disease. There are six ways in which insects are a benefit: As destroyers of injurious insects; as destroyers of noxious plants; as pollinizers of plants; as scavengers; as makers of soil, and as food (for man and beast), clothing, and use in the arts. Each of these classes is enlarged upon and dealt with in some detail, the whole making a very readable address.

The work of the Massachusetts Gypsy Moth Commission has been continued along the lines planned last year. The legislature appropriated \$200,000 for the work of the commission, of which it was intended \$10,000 should be used in attempting to kill off the brown-tail moth, which has become a pest in some parts of the district already infested with the gypsy moth. The State has now expended about a million dollars, and in the towns where the gypsy moth first began its destructiveness, it is still a serious nuisance. This fact has caused considerable criticism of the commission and its methods of work, and there was strong opposition to appropriating any more money for what seems such an endless task. But the legislature finally took the advice of those best qualified to judge, and granted the appropriation as requested.

Literature.—The year 1899 has seen a large amount of entomological literature published, though the bulk of it has been technical, and deals largely with the systematic side of the subject. The most important book which has appeared is doubtless Vol. VI. of the *Cambridge Natural History*, entitled *Insects, Part II.*, by Dr. David Sharp. The volume treats of the great bulk of the true insects, all the large and most interesting groups receiving attractive and thoroughly scientific treatment. While the illustrations are not above criticism, the text seems to have called forth only favorable comment, which is the more remarkable when we consider the immense amount of material that is condensed within these 600 pages. Naturally much attention is given to the habits of the ants and bees, especially the former, and the latest observations are made use of to bring this part of the subject

right up to date. Indeed, it may be truthfully said that few, if any, natural histories of insects have ever included so much of the results of recent research work. Several popular books on insects have appeared, chiefly referring to the butterflies and moths. One of the best of these is *Everyday Butterflies*, by the well-known entomologist, Dr. S. H. Scudder. It is not nearly so elaborate a work as Dr. Holland's *Butterfly Book*, which appeared last year, but it contains nearly 400 pages, and is fully illustrated with text figures, and nine plates, eight of which are colored. It treats of the life, history, habits, and distribution of 62 of our commoner Eastern butterflies, in a style combining literary grace with the most scientific accuracy. It will prove an admirable book for those who are beginners in the study of our *Lepidoptera*. Another work dealing with these insects is Vol. V. of Mr. Charles G. Barrett's *Lepidoptera of the British Islands*, which appeared in the early spring. This volume contains 381 pages, and is issued in two editions, one with, the other without plates. It deals with the Noctuae only, and of these 111 species are treated. A more popular work dealing with another group of insects, is *True Tales of the Insects*, by L. N. Badenoch. It is a volume of 250 pages, with 44 excellent illustrations. The more interesting families of the *Orthoptera* are described, their habits, transformations, and senses being handled in a way that is both entertaining and instructive. In addition there are chapters on butterflies and various species of moths. On the whole, the author has made a useful and attractive book. See ZOOLOGICAL LITERATURE (paragraph Popular Books).

EPILEPTIC COLONIES. A bill for the establishment of an epileptic colony in Illinois passed both houses of the legislature of that State in November, 1899. An appropriation of \$25,000 is to be made by the State for necessary preliminary expenses, under the supervision of the State commissioners of public charity. An appropriation has been asked from the legislature for the purchase of 1000 acres of land for the colony. It was estimated, in a report to the State commissioners in 1894, that there were 8000 epileptics in the State. The number is believed to be smaller now. Several States have institutions for feeble-minded and epileptic patients, or for defective or degenerate children from any cause; but there are only five that have established institutions exclusively for the epileptic. These are Massachusetts, New York, New Jersey, Texas, and Ohio. The last named has a large hospital for epileptics at Gallipolis; the others have colonies. The largest and best equipped of the colonies is that of New York State, at Sonyea, near Mt. Morris, in the Genesee Valley. This is called Craig Colony. The tract includes over 1000 acres of well-watered, fertile land, largely under cultivation. It was purchased from a dwindling Shaker colony in 1894, with buildings and roads, railway facilities and other improvements. Craig Colony was opened for patients in January, 1896. The present capacity of the institution is for 360 patients. No children under 7 years are admitted at present. Over 700 applications are now on file. When a group of buildings, now in process of erection, is completed the number accommodated will reach 620 patients. On January 27, 1899, at the end of the third fiscal year, the colony contained 353 patients, 163 males and 190 females. Of the females 33 were under 16 years of age, and of the males 20 were under 16 years of age. There were 6 males and 9 females in the hospital at this date. Between January 27, 1896, and January 27, 1899, 455 cases were received, 232 males and 223 females. During this period 102 were discharged, as follows: Recovered, 7; improved, 40; unimproved, 17; insane, 12; died, 26. Four of the twelve insane patients were insane when admitted. They were all transferred to the State hospitals. The value of the products of the farm and of the various departments of the colony reaches \$36,889 annually.

The Massachusetts colony for epileptics is at Monson, and includes 237 acres, about one-half of which is tillable. It was opened May 2, 1898, and contains 200 inmates, the sexes being about equally divided. The New Jersey colony is at Skillman, Somerset County, and includes 187 acres. The property was purchased in the autumn of 1898, and an appropriation has been made by the legislature of 1899 for the erection of cottages and for the purchase of additional land. The establishment is not yet opened for the reception of patients. The Texas colony was established under an act passed in 1899, appropriating \$50,000 for the purpose. It will be situated at Abilene, where a site of 640 acres has been donated by that city. There is in Pennsylvania a private corporation known as the Pennsylvania Epileptic Hospital and Colony Farm. This establishment was started February 3, 1898, at Oakbourne, on a farm of 110 acres. On the 4th of March, 1899, there were in the two cottages 30 patients, 12 men and 18 women.

At Chalfont St. Peter, England, a farm of 135 acres was purchased in 1893 by the National Society for the Employment of Epileptics, and the first building in the colony was opened for patients in August, 1894. At present there are six houses, with accommodations for 66 men, 24 boys, 24 women, and 24 girls, besides a hospital with ten beds. Patients enter the colony voluntarily, without commitment.

The colony of Bethel, near Bielefeld, Germany, established in 1867, has, under the

celebrated Pastor von Bodelschwingh, had a marvellous development. On the 1st of July, 1898, the settlement contained with its officers, physicians, nurses, and employees about 3500 persons. There are eleven medical men and six pastors in attendance. There were 1516 epileptics in the colony on July 1, 1898. During 1897, 1691 were cared for, about equally divided in number between the sexes. During the year 250 patients were received and 199 were discharged. The entire number received up to January 1, 1899, was 5028. Of these 388, or 7.7 per cent., were cured; 1099, or 21.2 per cent., were discharged improved; 1058, or 21 per cent., as not cured, and 991, or 19.7 per cent., died. About 61 per cent. of those discharged as cured were under 18 years of age. Only 47 have been turned over to insane asylums. On the 1st of January, 1898, there were but 13 male and 12 female patients in the "cell houses" of closed departments for cases of mental derangement.

EPISCOPAL CHURCH. See PROTESTANT EPISCOPAL CHURCH.

EPWORTH LEAGUE, a religious society of the Methodist Episcopal Church, in the United States, was organized in 1889. In 1899 it had 26,700 chapters and 1,900,000 members. The organ of the Epworth League is the *Epworth Herald* (weekly). President, Bishop William X. Ninde; secretary, Rev. Edwin A. Schell, 57 Washington Street, Chicago, Ill.

EPWORTH LEAGUE OF THE M. E. CHURCH, SOUTH, organized in 1891, had 5031 chapters in 1899, and 271,445 members. The League publishes the *Epworth Era*. President, Bishop F. A. Candler; secretary, Rev. H. M. Du Bose, Nashville, Tenn.

ERCKMANN, EMILE, joint author with Alexandre Chatrian, died at Lunéville, France, March 14, 1899. He was the son of a bookseller, and was born May 20, 1822, at Phalsbourg, Meurthe, then French territory, but now belonging to Germany. His education was irregular, and in 1842 he began a law course in Paris, which he pursued with various interruptions until 1858, when he abandoned it definitely for literature. In 1847 he had met Chatrian, and began with him the literary collaboration that continued almost to the time of the latter's death in 1890. It was not until 1863 that it became known that their books, written under the name of Erckmann-Chatrian, were not the work of a single person. Their first real success came with the publication of *L'illustre Docteur Mathéus* in 1859. From this time their popularity never left them. Their works reveal no small degree of versatility, depicting, among various other scenes, picturesque and faithful studies of German life and of the days of the Revolution and the empire in France. Many of their stories have been translated and are now familiar to English readers; especially well known is the drama *Le juif polonais*, which is in the repertory of Sir Henry Irving as *The Bells*. Their writings include: *Le sacrifice d'Abraham* and *Le bourgmestre en bouteille*, their first efforts; *Les chasseurs des reines* and *L'Alsace en 1814*, dramas; the romance, *L'illustre Docteur Mathéus*, 1859; the following romances and tales: *Contes fantastiques*, 1860; *Maitre Daniel Rock*, 1861; *Contes des bords du Rhin*, 1862; *L'invasion ou le fou Yégof*, 1862; *Le joueur de clarinette*, 1863; *La taverne du jambon de Mayence*, 1863; *Madame Thérèse*, 1864; *L'ami Fritz*, 1864; *L'histoire d'un conscrit de 1813*, 1864; a sequel of the three last named books, *Waterloo*, 1865; *Histoire d'un homme du peuple*, 1865; *La maison forestière*, 1866; *La guerre*, 1866; *Le blocus*, 1867; *Histoire d'un paysan*, 1868-70; *Histoire d'un sous-maitre*, 1869; *L'histoire d'un plébiscite, racontée par un des 7,500,000 Ouis*, 1872; *Le brigadier Frédéric*, 1874; *Maitre Gaspard Fix*, 1876; *Souvenirs d'un chef de chantier à l'isthme de Suez*, 1876; *Contes vosgiens*, 1877; *Le grand-père Lebigre*, 1880; *Les Rantzau*, 1882; *Masséna et Souvarof*, 1885. Subsequent to Chatrian's death in 1890 Erckmann published *Kaleb et Khora* and *La première campagne du grand-père Jacques*.

ERITREA, or ERYTHREA, is a possession of Italy on the western coast of the Red Sea, along which it lies as a narrow strip of country some 670 miles in length. The British-Egyptian Soudan bounds it on the north, and French Somaliland on the south, while on the west it is confined by Abyssinia. Eritrea has an area estimated at about 88,500 square miles, and a population, largely nomadic, estimated at 450,000. The government is under a civil governor, nominated by the king, and placed under the direction of the Italian minister of foreign affairs. Farming is pastoral rather than agricultural, the products being chiefly meat, hides, butter, and other supplies sustained by sheep, cattle, and goat herds. The principal town and the seat of government is Massowah, on the Red Sea. It has a population of 7775, including about 600 Europeans, not counting the garrison. At Massowah, and also at the Dahlak Peninsula, there are pearl fisheries of considerable importance. The trade of Massowah consists almost entirely of goods in transit, those coming from the interior of Africa being exported to India, Europe, or the Red Sea ports, and those imported into Massowah by sea being destined for the interior. The latest figures available are for 1896, when the imports at Massowah showed a value of

\$3,342,750, an increase within the year of \$1,496,351, or 45 per cent. Massowah is connected by a military railway, 17 miles in length, with Saate, and by short lines aggregating 16 miles with other points. It is also connected by telegraph with Perim, via Assab, a distance of 380 miles. Eritrea has undergone several changes of territory since it passed from the control of Egypt to that of Italy in 1886. During 1889-91 Italy secured Hameson and the northern districts, and some coast-line from Abyssinia. In 1894 Kassala was captured from the Dervishes. Kassala was recaptured by the Egyptians in 1897, and in 1896 Abyssinia forced Italy to restore the greater part of the districts which had been taken by her, and to recognize the complete independence of Abyssinia. In fixing the boundary line between Eritrea and Abyssinia, in 1897, Italy was in addition shut out of two important provinces which had been claimed by her. A commercial treaty was, however, arranged between the two countries, by which the facilities for commercial relations between Abyssinia and the Italian possessions were to be promoted. In this treaty Italy secured a representative in the Abyssinian court, and full freedom of trade and travel for her citizens in Abyssinia. She also secured protection for her merchants, and the application to herself of the most-favored-nation clause.

ERMENTROUT, DANIEL, Democratic member of Congress from Pennsylvania, died at his home in Reading, September 17, 1899. He was born in Reading, January 24, 1837, and was educated in the public schools of that city and at Franklin and Marshall College, and at the Elmwood Institute at Norristown, Penn. He studied law, and in 1859 was admitted to the bar. In 1862 he was elected district attorney of Berks County, and held the position for three years; from 1867 to 1870 he was solicitor for the city of Reading. He was elected to the State Senate in 1873, and in 1876 was returned for the ensuing term. In 1880 Ermentrout was elected to Congress to represent Berks County, which at that time constituted the eighth congressional district; he was re-elected for the Forty-eighth, Forty-ninth, and Fiftieth Congresses, serving continuously until 1889. Berks and Lehigh Counties now constitute the ninth district, and this in 1896 he was elected to represent in the Fifty-fifth Congress; in 1898 he was re-elected for the next Congress. For many years Ermentrout was a member of the Reading Board of School Control.

ESHER, First Viscount, WILLIAM BALIOL BRETT, K.B., was born August 13, 1815; died May 24, 1899. He was educated at Westminster and at Caius College, Cambridge, receiving his M.A. degree in 1840. He studied law and was admitted to practice, Lincoln's Inn, in 1846; in 1860 he became a Queen's counsel, and was solicitor-general in 1868. From 1866 to 1868 he sat in Parliament as a Conservative for Helston. In the latter year he was also made justice of common pleas; he served thereafter on the English bench for thirty years. In 1875 he became a judge of the High Court of Justice, and in the next year lord justice of the Court of Appeal. He was made a K.B. in 1868, from 1883 to 1899 was master of the rolls, and was raised to the peerage in 1897. His son, Reginald Baliol Brett, succeeds to the title.

ESTERHAZY, MARIE CHARLES FERDINAND WALSIN. See FRANCE (paragraphs on History).

ETHICAL CULTURE SOCIETY FOR, organized in 1876 by Dr. Felix Adler, had in 1899 a membership of 880. It conducts a secondary school at 109 West Fifty-fourth Street, New York. There are ethical culture societies in Philadelphia, Chicago, St. Louis, and in various cities in Germany, Switzerland, Austria, and Italy. There will be an international congress of the Society for Ethical Culture in London in 1900. The society publishes the *Ethical Record*. President, John D. Lange; secretary, Robert D. Kohn, 669 Madison Avenue, New York City.

EUSTIS, JAMES BIDDLE, LL.D., former United States ambassador to France, died at Newport, R. I., September 9, 1899. He was descended from an old Creole family of Louisiana, and his father, George Eustis, was at one time chief justice of that State. He was born in New Orleans, August 27, 1834; was educated in the public schools of Brookline, Mass., and in 1853-54 attended the Harvard Law School, where he received the degree LL.B. Having entered his father's law office, he was admitted to practice in New Orleans in 1856. At the outbreak of the Civil War he entered the Confederate service as judge-advocate on the staff of General Magruder, and in 1862 was transferred to the staff of General Joseph E. Johnston, with whom he remained until the close of the war. He resumed his legal practice, and having entered politics served in the lower house of the Louisiana legislature in 1872, and in the Senate from 1874 to 1878. It was during this time that he was chairman of a legislative committee that unsuccessfully attempted to arrange with the authorities at Washington for a more satisfactory method of the reconstruction of Louisiana. In 1876 Eustis was elected as a Democrat to the United States Senate, but in 1879 he resigned and accepted the chair of civil law in the University of Louisiana; this he retained until elected again to the Senate for the term from 1885 to 1891. In

this second term he displayed opposition to many of the official acts of President Cleveland. He subsequently, however, seemed to arrive at an understanding with the President, for at the beginning of the latter's second term he was appointed the first United States ambassador to France. He served in this capacity from 1893 to 1897. This appointment received general approval. Earlier in his life Eustis had lived for a time in Paris, and by his knowledge of French and his professional attainments, together with his force of character, he performed the duties of ambassador with dignity and ability. He translated into English Guizot's *Histoire générale de la Civilisation en Europe*.

EVANGELICAL ASSOCIATION, sometimes incorrectly called the German Methodist Church, founded 1800, reports an unprecedented financial success during the year 1899. The Missionary Society reported total receipts for the year to the amount of \$199,673, making a total receipt of \$879,757. The missionary debt was liquidated. The general conference met in quadrennial session at St. Paul, Minn., in October. In 1899 this denomination had 1031 ministers, 1819 churches, and 117,613 communicants. This body and the United Evangelical Church (*q. v.*) has, according to the latest report of the Commissioner of Education, published 1899, 3 institutions of learning, with 19 professors, 177 students, and endowment funds of \$24,000.

EVOLUTION. See BIOLOGY; ZOOLOGICAL LITERATURE (paragraph General Treatises).

EXMOUTH, Fourth Viscount, EDWARD FLEETWOOD JOHN PELLEW, died November 1, 1899. He was the son of the Hon. Fleetwood John Pellew, son of the third viscount. His great-grandfather, the first peer, was the famous Admiral Pellew who captured the French frigate *Cleopatra* in 1814, and who received his title in 1816 for his gallantry in bombarding and destroying the fleet and arsenal of Algiers. Lord Exmouth was born in 1861; he was a captain of the Fifth Volunteer Battalion of the Devonshire Regiment. His son, the Hon. Edward Pellew, succeeds him.

EXPANSION, TERRITORIAL. See COLONIES; UNITED STATES (paragraphs on History).

EXPERIMENTAL PSYCHOLOGY. See PSYCHOLOGY, EXPERIMENTAL.

EXPLORATIONS. See ZOOLOGICAL STATIONS; also ARCTIC EXPLORATION and ANTARCTIC EXPLORATION.

EYE. See ACOIN; ARECOLIN.

FABIAN SOCIETY, founded in England in 1883, has for its object the furtherance of socialism. Had in Great Britain in 1899 a membership of 861, including about 150 lecturers. There are branch societies in English universities and in various parts of the United States. The publications of the society include *Fabian Essays in Socialism* and *Fabian Tracts*. Secretary, E. R. Pease, 276 Strand, W. C., London, England.

FAIRBAIRN, ANDREW MARTIN, M.A., D.D., LL.D., principal of Mansfield College, Oxford, extended in 1899 his list of religious publications with *Catholicism, Roman and Anglican*, and *The Person of Christ and the Philosophy of Religion*. He was born November 4, 1838; entered the ministry; was principal of Airedale College, Bradford, 1877-86; principal of Mansfield College from its foundation in 1886. He was the Lyman Beecher lecturer at Yale in 1891-92, the Morse lecturer at Union Theological Seminary, New York, 1893, and the Haskell lecturer at the University of Chicago, 1898-99. The subject of the Haskell lectures was *Comparative Religion in India*.

FAIRBAIRN, ROBERT BRINKERHOFF, D.D., Protestant Episcopal clergyman and educator, died in Brooklyn, N. Y., January 27, 1899. He was born in New York City in 1818; was educated at Trinity College, Hartford, and the General Theological Seminary, New York. In 1843 he was ordained deacon, and became rector of Christ Church, Troy. His next charge was St. John's Church, Stillwater, N. Y. In 1853 he assumed the principalship of Catskill Academy and ten years later became professor of mathematics in St. Stephen's College, Annandale, N. Y. Subsequently he was made warden of the college; he retired several months before the time of his death. Dr. Fairbairn had been a vice-president of the American Meteorological Society, an honorary fellow of the Society of Science, Letters, and Art, of London, and an associate of the Victoria Institute of Great Britain. Among his publications may be mentioned *The Child of Faith*; *College Sermons*; *Of the Doctrine of Morality*; and *The Unity of Faith*, 1895.

FAITH CURE. See SUGGESTION.

FALKLAND ISLANDS, a crown colony of Great Britain, lie about 300 miles east of the Straits of Magellan, between about 51° and 53° south latitude and 57° and 62° west longitude. They comprise upward of 100 small islands, of which

East Falkland has an area of 3000 square miles and West Falkland 2300 square miles, the total area being 6500 square miles. According to the census of 1891, the population was 1789; in 1896 the number had increased to 1992 and in 1897 to 2050. The chief town and seat of government, Stanley, on the coast of East Falkland, has about 694 inhabitants. There are three churches—an Anglican, a Roman Catholic, and a Baptist. Education is provided for by two government schools, one Roman Catholic school, one Baptist, and the Darwin school, the aggregate number of pupils in 1897 being 231.

The administration of the colony is vested in a governor, assisted by an executive and a legislative council, all of whom are appointed by the crown. The governor and chief justice since 1897 has been William Grey-Wilson, C.M.G., formerly governor of St. Helena. The statistics of finance and commerce are as follows:

	1895.	1896.	1897.	1898.
Revenue.....	£12,518	£12,358	£12,970	£13,039
Expenditure.....	13,159	13,569	13,636	14,278
Imports.....	71,826	69,985	63,286	72,987
Exports.....	122,988	132,194	125,123	106,984

The principal items of revenue are customs and the rents of crown lands, and of expenditure, mails and public works. The chief industry is sheep-raising, there being about 732,000 sheep and 2,325,000 acres of pasturage. The exports are principally wool, hides, skins, and tallow, and the imports provisions, apparel, iron goods, machinery, and building materials; the foreign trade is almost entirely with Great Britain. In 1898 the wool export amounted to £92,206. The shipping entrances in 1897 were 42 vessels of 54,144 tons; the combined entrances and clearances for 1898 aggregated 124,147 tons. About 15,000 letters and post-cards and 14,400 pounds of newspapers pass through the post-office yearly. South Georgia, a barren and uninhabited island with an area of 1000 square miles, lying some 1000 miles east-southeast of the Falkland group, and several other small islands, are included in the colony.

FALLIÈRES, CLÉMENT ARMAND, French statesman, was elected president of the senate on March 3, 1899, to fill the vacancy caused by the election of M. Émile Loubet to the presidency of the republic. M. Fallières is regarded as a politician, neither brilliant nor ambitious, but diligent and conscientious, and he is said to have the confidence of all parties. He is a Positive Republican, but for the time being favors an opportunist policy. He has held the following cabinet positions: Minister of the interior, 1880 and 1882; minister of foreign affairs, 1883, and in the same year minister of public instruction; minister of justice, 1887, and minister of the interior, 1887; minister of public instruction, 1889; minister of justice, 1892.

FARMERS' ALLIANCE AND INDUSTRIAL UNION, NATIONAL, founded in Texas in 1876, has spread to other States. Its object is the betterment of the agricultural classes and the development of good citizenship. President of the National Society, J. C. Wilborn, Old Point, S. C.; secretary-treasurer, A. B. Welch, Victor, N. Y.

FARRER, First Baron, Sir THOMAS HENRY FARRER, a high authority in England on questions of trade and finance, died October 12, 1899. He was born June 24, 1819; was educated at Eton and at Balliol College, Oxford. He was admitted to the bar, and in 1850 was appointed assistant secretary in the marine department of the Board of Trade. Subsequently he became permanent secretary of the Board of Trade, resigning the position in 1886. He had been a member and vice-chairman of the London County Council. In 1883 he was created a baronet, and in 1893 was raised to the peerage for his distinguished public services. He was a Liberal in politics and was an advocate of the "open door" policy. Among his best known publications are *Free Trade vs. Fair Trade* and *Studies in Currency*, 1898.

FAUNCE, WILLIAM HERBERT PERRY, A.M., D.D., president of Brown University, was elected to his present position on June 3, 1899, to succeed Dr. E. Benjamin Andrews, who resigned in 1898. At the time of his election Dr. Faunce was pastor of the Fifth Avenue Baptist Church in New York City. He was born in Worcester, Mass., January 15, 1859; he prepared for college at Concord, N. H., and having entered Brown, was graduated there in 1880. He taught mathematics at the university during the following year and then entered the Newton Theological Institution, being graduated at the head of his class in 1884. His first charge was the State Street Baptist Church in Springfield, Mass., where he remained until 1891, when he accepted a call to the Fifth Avenue Church in New York. He has served as university preacher at Harvard, and has lectured at various educational institutions. His inauguration took place on October 17, 1899.

FAURE, FRANÇOIS FELIX, sixth president of the third French Republic, died suddenly of apoplexy at the presidential palace, Elysée, in Paris, on the evening of February 16, 1899. He had been president of France for four years, having been elected on the 17th of January, 1895, and his term of office lacked three years of expiration. President Faure, who arose from the *bourgeoisie*, was not regarded as a great statesman, but was recognized as a man of personal integrity, and of shrewdness and ability in matters of politics and finance.

Faure was born in Paris, January 30, 1841. His father was a cabinet-maker, who had become sufficiently prosperous to send Felix, when the latter was ten years old, to the Institution Bousquet, at Chaillot, and later to enable the boy to pass two years in England to receive a commercial education and to learn the language. So thoroughly did he master English that he was said to speak it without an accent. Returning to France, he served for three years as a tanner's apprentice at Amboise, and subsequently worked for some time at his trade as a journeyman. Having gained not only a detailed knowledge of the leather business, but a thorough business training, he engaged himself to a large leather firm in Havre, where he was soon taken into partnership, and afterward became the head of a commercial house that grew to be one of the most important in the city. His leather business became exceedingly large, bringing to Faure proportionate profits, which, from time to time, he invested in other commercial enterprises, including importing, shipowning, etc. He gained much popularity in Havre, where he came to be known as an authority on finance and the author of a work entitled *The Comparative Budgets of European States*. He was intimately associated with various charitable and other organizations for public improvement; and at one time delivered lectures on history at an evening school in the city. When the Franco-Prussian War broke out Faure, then in his thirtieth year, was president of the Chamber of Commerce at Havre.

During the war he served as a captain in the Garde Mobile, and for remarkable courage was rewarded with the cross of the Legion of Honor. His real political career began in 1881 when, as a Republican, he was elected to represent Havre in the chamber of deputies. In the same year, on account of his advocacy of the opportunist policy of Gambetta, the latter called him to his cabinet as under-secretary of state for commerce and the colonies. This cabinet fell in 1882, but in 1883-85 Faure held the same position in Ferry's last cabinet. In 1885 he was sent again to the chamber of deputies, and in 1888 again took charge of his old portfolio, in the cabinet of M. Tirard. Faure was returned again from Havre to the chamber of deputies in 1888, and in 1894, during the brief presidency of M. Casimir-Périer, was minister of marine in the cabinet of M. Charles Dupuy.

The resignation of President Casimir-Périer in January, 1895, was probably brought about by his realization of the insecure situation of the French political parties, which might be seen from the dissensions existing among the several groups of Republicans. It was seen that a moderate Republican was needed for the presidency—a man who not only would compel respect, but who would for a time at least insure political quiet and freedom from attempted revolution. M. Waldeck-Rousseau seemed to be favored by the moderate Republicans, but he withdrew his candidacy after the first ballot; on the second ballot the national assembly (consisting of the senate and the chamber of deputies) elected Faure by a vote of 430 against 361 for M. Henri Brisson, January 17, 1895.

It was not expected that President Faure would inaugurate any great policy, and he did not. He was a man of unflagging industry, and constantly strove to invest his office with a courtly dignity and ceremonial splendor. Indeed, such a stickler for form and ostentation was the president that he made himself almost ridiculous in the eyes of the world. If Faure had been a truly great man, the regal ceremonies would have seemed more appropriate, or, rather, it is likely they would not have taken place at all. But though worthy and able, he was not a great man; to be sure, no revolution was attempted during his administration, and it was for a check to revolution that his election was effected; but immediately before his death there were abroad ominous rumors of a Bonapartist *coup d'état*. In regard to the Dreyfus affair, it was known that to the last his sympathies were with the anti-revisionists; Dreyfus was first convicted when Faure was a cabinet minister. A prominent event of his administration, and one in which he took much pride, was the alliance between France and Russia, which followed upon Faure's visit to the Czar in August, 1897. Faure was a man neither of lofty ideals nor of far-reaching and comprehensive plans; he was commonplace; but he seems to have served France in a way that will not bring upon him any considerable amount of disapproval.

FEARN, J. WALKER, was born at Huntsville, Ala., January 13, 1832; died at Hot Springs, Va., April 8, 1899. He was graduated at Yale in 1851, and two years later was admitted to the bar in Mobile. He entered the diplomatic service in 1854 as secretary of legation in Brussels; from 1856 to 1858 he held a similar position in

Mexico. In 1861 he was one of the Confederate commissioners to the European powers, and later served in Virginia on the staff of General Joseph E. Johnston. In 1863 he again acted as diplomatic agent for the Confederacy, first in Europe with L. Q. C. Lamar and then in Mexico with General William Preston. Subsequently he became adjutant-general of the trans-Mississippi department under General Kirby Smith. At the close of the war he resumed the practice of law in New Orleans, and later was called to the chair of French, Italian, and Spanish in the University of Louisiana. This position he retained until 1884, when he went to Europe as commissioner of the New Orleans Exposition. In his first administration President Cleveland appointed Mr. Fearn minister to Greece, Roumania, and Servia; under the second Cleveland administration he was a judge of the International Court at Cairo, Egypt.

FEDERATION OF LABOR, AMERICAN, established in 1881, had in 1899 an estimated membership of 700,000. The nineteenth convention was held in Detroit, Mich., December 11-20, 1899; the convention of 1900, to be held the second Monday in December, at Louisville, Ky. The gain in membership during 1899 was 144,282; the report of strikes showed 425 won, 39 compromised, 89 pending, and 48 lost. The *American Federationist* is the official organ; in addition the association publishes many pamphlets and other papers. President, Samuel Gompers; secretary, Frank Morrison, Washington, D. C.

FENCING has increased in vogue during the past few years in the best class of sportsmen, and has taken a recognized place in college competitions. The college teams are annually entered in the contests in the junior championships at New York. These contests on April 1, 1899, resulted as follows: Harvard (36), first; Boston Athletic Association (31), second; New York Athletic Club (27), third. The American Fencing League's annual tournament was held at New York on February 17. In foils, Cecil Lyons, New York Athletic Club, won by a score of 250, with an allowance of 60; in duelling swords, R. Brownell won with 11½ points. In the national championships, at Boston, April 14-15, G. D. Kavanagh, New York Athletic Club, won in foils (10), and sabres (21), and M. de Diaz, Boston Athletic Association, won in duelling swords (10). The Fencing League's team championship, New York, April 20, was won by the Fencers' Club (3) from the New York Athletic Club (2).

FERDINAND I, PRINCE OF BULGARIA, the youngest son of Prince Augustus of Saxe-Coburg and the Princess Clémentine of Bourbon-Orleans, a daughter of Louis Philippe, was born in Vienna in 1861. He served as an officer in the Hungarian army, and after Prince Alexander was deposed in 1886, he accepted the offer of the throne of Bulgaria, and took his oath August 14, 1887. His sovereignty was, however, not formally recognized by the Porte and Powers until 1896. In view of the financial condition, Prince Ferdinand announced on November 10, 1899, that he would relinquish half of his Civil List for 1900, and the government decided that it would reduce the salaries of civil, military, and ecclesiastical functionaries.

In April, 1893, he married Marie Louise, daughter of the Duke of Parma, of the house of Bourbon. Princess Marie died at Sofia, January 31, 1899. She was born January 17, 1870. The death of the Princess Marie recalled the enmity that existed between her and the Bulgarian statesman, Stefan Stambuloff, whose death on July 18, 1895, resulting from a murderous attack upon him three days previously, was alleged by his friends to have been contrived by the princess. Being a Roman Catholic, she was deeply grieved at the admission of her eldest child, Prince Boris, into the Greek Church in 1896. Four children survived the princess, two sons and two daughters, the second daughter having been born the day preceding the mother's death.

FIELD, General Sir JOHN, K.C.B., was born in 1821 and died April 16, 1899. He entered the British army in 1839; saw active service in the Scinde and Afghan wars of 1840-44, in the Indian mutiny of 1857-59, and in the Abyssinian war of 1867-68. He was promoted to the rank of general in 1888.

FIELD, STEPHEN JOHNSON, LL.D., associate justice of the United States Supreme Court, retired, died in Washington, D. C., April 9, 1899. He was the son of the Rev. David Dudley Field, D.D., and was one of seven brothers, three others of whom won a permanent and honorable place in American history—David Dudley, the eminent jurist; Cyrus West, the projector of the Atlantic cable, and Henry Martyn, clergyman, author, and editor of the *Evangelist*, who alone survives. Justice Field was born at Haddam, Conn., November 4, 1816. When the boy was three years old his family moved to Stockbridge, Mass., and at the age of thirteen he went abroad with his sister and brother-in-law, who was a missionary, and passed three years in Greece and Smyrna. This sojourn proved to be of great educational value to young Field, for he not only studied Greek and other languages, but he

observed the political and social conditions of the East and had opportunity to see the results of war and pestilence. Returning to the United States, he entered Williams College, and was graduated in 1837 at the head of his class. He studied law in New York, and being admitted to the bar, began practice in that city as a partner in the firm of his brother, David Dudley. He withdrew from the firm in 1848, and passed a year in Europe. In 1849 he went to California, and the following year was made the first alcalde of the new town of Maryville. The same year he was elected to the legislature, but he held the position of alcalde until the judiciary was organized under the constitution of the State. In the legislature he was chairman of the judiciary committee. The result of his work touching the powers of courts and judicial officers is largely embodied in the code of the State; and the laws he effected regarding mines and mining have been extended to the other mining regions of the country and finally adopted by Congress. His influence upon the establishment of mining laws and usages was continued after he was elected to the Supreme Court of California in 1857 and after he succeeded David S. Terry as chief justice two years later. It was largely his decision also that placed the laws of real property on a firm basis. It is said that out of the lawless conditions in California he evolved a legal system, and that in conformity with his principle that "usage and customs which necessity has established must be law, except when in conflict with the constitution of the State," were the statutes of California formed.

A Republican President, Abraham Lincoln, appointed Judge Field, a Democrat, an associate justice of the United States Supreme Court in 1863, and the career then entered upon was destined to be the longest in the history of the supreme bench. Though many celebrated principles were established by Justice Field in this court, only a few of his more notable acts can be mentioned. In the famous "test-oath" cases he rendered the opinion that proof of treason is as necessary as proof of any other crime, and that persons who had participated in the Rebellion be released from the disabilities imposed by the statutes which had been passed during the war. In a dissenting opinion he denied that Congress has the right to exercise coercive authority over judicial officers of the States in the discharge of their duties under State laws. Another dissenting opinion, which is held to be of high importance, he delivered in 1870, when he denied the power of the government to alter the currency standard. Still another dissenting opinion of his held that an income tax law is thoroughly unconstitutional. In 1869 Justice Field was appointed professor of law in the University of California. In 1873, by appointment of the governor, he served as a commissioner to examine the codes of California and to prepare amendments. He was a member of the Electoral Commission of 1876, which, many believe, made the error of placing Hayes, instead of Samuel J. Tilden, in the Presidential chair. Field, however, was one of the seven members who voted for Tilden. In 1880 at the Democratic National Convention in Cincinnati he received 65 votes on the first ballot for the Presidential nomination. In 1889 an attempt was made on Justice Field's life by Judge Terry, with whom he had formerly been associated on the California bench; but before Terry could fire the revolver which he had drawn, he was shot and killed by Marshal Naegle.

Justice Field had a strong dislike for President Cleveland, and was determined that the latter should not appoint his successor. His resignation accordingly was not tendered until after the inauguration of President McKinley, and it took effect December 1, 1897. He had completed a longer term of service than any other Supreme Court justice—amounting to thirty-four years and six months. According to his own statement, Justice Field alone wrote 57 opinions in circuit court, 365 opinions in the Supreme Court of California, and 620 in the Federal Supreme Court—1042 in all. Notwithstanding his prominence in California and his inestimable service to that State, it is said that he was not popular there, the reason being due to his alleged friendliness toward corporations; on the other hand, the citizens of Chicago hold him in kind remembrance for a decision he rendered against a corporation, whereby he saved to the people the lake front of the city against the proposed encroachment of the Illinois Central Railroad. At the time of his death a well-known paper said: "His decisions were always on the side of personal liberty, and he adhered firmly to what he deemed right, regardless of policy or pressure. His absolute disregard of prevailing public opinion and even of bodily harm in doing his duty was proved in many ways." With the passing of Justice Field, America lost an eminent lawyer, an honorable judge, and a noble citizen.

FIELD, WALBRIDGE ABNER, LL.D., chief justice of the Supreme Judicial Court of Massachusetts, died at his home in Boston, July 15, 1899. He was born at Springfield, Vt., April 26, 1833; was graduated with the highest honors at Dartmouth College in 1855; in this year he went to Boston, studied law, and in 1860 was admitted to practice. From 1865 to 1869 he was assistant United States attorney for Massachusetts, and in 1869-70 was assistant United States attorney-general. In 1876 he was elected to Congress, as a Republican, and occupied his seat until the Demo-

cratic House gave it to Mr. Dean, March 28, 1877. Field was re-elected, and served in the next Congress. In February, 1881, he was appointed by Governor John D. Long to the bench of the Supreme Court. By the appointment of Governor Roger Wolcott, Judge Oliver Wendell Holmes succeeded Judge Field as chief justice of the Supreme Judicial Court of Massachusetts.

FIELD COLUMBIAN MUSEUM. See ANTHROPOLOGY IN AMERICA.

FIJI ISLANDS are a group of over 225 volcanic and coral islands in the South Pacific Ocean, of which nearly two-thirds are uninhabited. The two largest islands are Viti Levu, area 4250 square miles, and Vanua Levu, area 2600 square miles. The total area of the group is 8045 square miles, and the population is something over 120,000, which includes 3900 Europeans, 1200 half-castes, and the remainder Indians, Polynesians, Rotumans, Fijians, etc. The group belongs to Great Britain, and is known as the Fiji colony. It was acquired in 1874, in which year it was voluntarily ceded by the chiefs and people. The island of Rotuwah, population 2400, to the north of the group, was added to the colony by Great Britain in 1881. Fiji is administered by the British high commissioner and consul-general for the Western Pacific, acting as governor of the islands, who appoints the legislative council, a body of six official and six unofficial members. In civilization and trade the Fiji Islands have made progress. The climate, though tropical, is not unhealthful, as shown by the large colony of Europeans resident in the islands. The soil is fertile, and produces for export sugar, copra, fruit, cotton, maize, and peanuts. Pearl shell, tobacco, and distilled spirits are also exported. According to a United States Consular Report, invested capital has given a good return, exports exceed imports, and the population is increasing. The total revenue for 1898 was \$458,249 and the expenditures, \$426,276, giving a surplus of \$31,973. The total imports amounted to \$1,142,893 and the exports, \$2,599,222, there being a slight decrease in imports and an increase of nearly 20 per cent. in exports within the year. The principal exports in 1898 were as follows: Copra, \$307,266; fruit, \$123,948; distilled spirits, \$67,576; sugar, \$1,950,897; maize, \$12,035; peanuts, \$12,721; pearl shell, \$11,329. There is little or no direct trade with Great Britain, but a considerable amount is carried on with the British colonies of New Zealand, New South Wales, Victoria, and New Caledonia. Excluding two state public schools (with 200 pupils) and one industrial school, education is carried on almost entirely by the Wesleyan missionaries, who teach over 35,000 native children, scattered through 2064 schools. The Roman Catholic mission maintains 141 schools, which accommodate 2000 scholars. The latter have 3 schools for Europeans also, with an attendance of 150 among the three. The Wesleyans were the earliest missionaries to attempt the conversion of the natives. They had in 1897, 972 churches and 339 other preaching places, with an attendance of 95,056. The Roman Catholic churches had an attendance of over 9000.

FILTRATION. See SEWAGE PURIFICATION and WATER PURIFICATION.

FINANCE. The treatment of financial topics may be found in the articles on the various countries. See also the articles BANK-BANKING; CURRENCY REFORM; MONEY.

FINLAND, formerly a grand duchy, but now a Russian province, was the object of considerable discussion in 1899 on account of the loss of its constitutional liberties and the measures taken by the Czar for the Russianization of the duchy. There was a general expression of sympathy for the Finns, which was especially strong in America. In Europe the agitation took an active form in the appointment of a committee of citizens, representing all the nations of western Europe, to plead the cause of Finland before the Czar. The attitude of Russia in regard to her Finnish policy remained unchanged throughout. It seemed, from the American point of view, that the most effective possible means were being taken to alienate a portion of the empire long distinguished for its loyalty and for the capable character of its people. Finland has fallen a victim, in fact, to the characteristic imperial policy of "Russification," which has already affected the Poles, the Jews, the German Lutherans about the Baltic, and other races—a policy which seeks to obliterate individual and race distinctions, break up local traditions and customs, disintegrate local governments, and bring down the people to the dead level of Russian national mediocrity. The Finns, whose case is no less significant than that of the disintegration of Poland, are among the most loyal and intelligent races in Russia, and possess the remarkable record for that dissatisfied country of having furnished not one conspirator, yet they have been deprived of their constitutional rights and autonomy, guaranteed them by successive emperors since 1809, and have been curtailed in the exercise of their native religion, language, and customs. Finland was conquered in the twelfth century by Sweden, and was at a later period possessed alternately by Sweden and Russia, becoming permanently Russian in 1809. Within all these periods and through the present century local customs have continued to develop in Finland, together with native language and free religion. The people minded their own affairs

and fulfilled their duties as Russian subjects, and developed within their local national sphere a high order of education, science, and arts. The local government was administered by a national parliament of its own, consisting of representatives of the four estates—namely, nobles, clergy, burghers, and peasants, whose assent was necessary to new taxation or changes in the constitution. The Emperor of Russia, who was the Grand Duke of Finland, summoned this assembly and in legislation had the right of initiation and veto. The highest administrative authority was exercised by a senate, sitting at Helsingfors, whose members were nominated by the Emperor and presided over by the governor-general of Finland. This senate was for the control of provincial affairs, while foreign and military affairs were mostly directed by the imperial officials. The constitution expressly stated that the army of Finland, commanded by native officers, could not without its own free will and the consent of parliament be taken outside the country to serve in any part of the empire. There is one exception, the life guards, who are soldiers immediately attending the person of the Czar, and Finland has had the distinction of having the guard drawn from her citizens since the time of Alexander I. But in 1898, by an imperial ukase, the constitutional military privilege previously mentioned was endangered, and an extraordinary session of the Diet, or parliament, was opened in January, 1899, to consider the question. While the Diet was sitting an imperial decree ordered that a knowledge of Russian would be obligatory for all senators, governors, and higher officials, and this was followed by a manifesto ordering that all new laws, instead of being affected by assent of the Diet, should be sent for final settlement to the Imperial State Council. These decrees, as the Finns were aware, were definite steps taken by Russia toward the breaking down of the historic constitution of Finland. The Diet and the senate strongly opposed the manifesto and sent a large delegation to St. Petersburg with a petition signed by nearly 600,000 Finns. The Czar refused both audience and consideration to the delegates. Thereafter the Diet declared that the manifesto did not possess the force of law in Finland—in other words, that it was unconstitutional, and that a law relating to military service (as stated above) could not be legally enacted, except in conformity with the Diet's decision. The Czar, under the policy apparently that kings know no law, declared that the manifesto was unshakable. He promised to take the Diet's opinion into consideration in finally drafting the military law. The close of the year, however, found Finland no longer a state in Russian eyes, and the office of grand duke has been abolished by the emperor, together with the dukedom. Whereas, also, Finland had its own constitution, supreme in part, with flag, currency, postage, state language, and free religion, with only citizens holding offices, there is now complete Russian domination in government, Russian officials are supplanting Finns, the army must serve for the empire, instead of being confined to the state, religious tolerance will be curtailed, all officials must be sworn in by the Russian Orthodox Church rites, Russian succeeds the Finnish and Swedish official and legal languages, newspapers are suppressed, and the country has, in fact, lost its national existence. This revolution has been such a blow to the liberty-loving Finns that the capital was draped in mourning after the return of the commission from St. Petersburg. Plans are reported for emigration in large numbers to Canada and America, including not only young men who wish to escape the conscription laws, but many others who fear that with the abolition of Finnish national life will come also the curtailment of personal liberty.

Finland has a population of about 2,500,000 inhabitants and an area of 144,255 square miles. Its chief exports, amounting in 1897 to 168,700 marks, are forest products, butter, paper, cardboard, iron and iron manufactures, sent to Russia, Great Britain, Denmark, France, Germany, Sweden and Norway, and Spain. The imports amounted to 202,500 marks. The chief crops of the country are oats, rye, barley, potatoes, peas, wheat, and flax; the manufactories include iron and mechanical works, dress and dyeing establishments, wood and bone industries, and leather, paper, chemical, and textile works. Fisheries and cattle-breeding are also important industries. The state has built and owns over 1500 miles of railways. In religion, the Lutheran Church numbers about 2,500,000 members, and the Greek Orthodox Church, 46,509. As to education, there are some 1400 schools, supported in part by the state. There is a university at Helsingfors with an attendance of over 2000. As an experiment the university has introduced a system of coeducation.

FIRE-PROOFING. See TALL BUILDINGS (paragraph Fire-proofing); GRAIN ELEVATORS; CLAY.

FIRE PROTECTION. Improvements in municipal fire protection during the year consist chiefly in securing a more ample and reliable supply of water, with better means for distributing it through the city or town, and of concentrating it where needed in time of fire. Larger water mains and better fire hydrants are being introduced in many cities. Various devices are being more commonly employed for testing at intervals the pressures of water-works systems. These consist chiefly of

cheaper and more convenient methods of attaching pressure gauges to fire hydrants. One such device has recently been perfected by Mr. F. B. Sanborn, of the Factory Mutual Insurance Company, of Boston, Mass., and another, recently described, was perfected by Mr. John Stagg, chief of the Fire Department of Paterson, N. J. An extensive series of tests of fire hydrants, made in 1897-98 for the Water Department of Holyoke, Mass., by Mr. Charles L. Newcomb, was reported early in 1899. The most significant results of the test were the small range of friction losses caused by most of the makes of hydrants tested and the fact that these losses might be still further reduced by more care in designing the waterways of the hydrants and in removing all projections and angles, as far as possible, in the finishing process.

From San Francisco it is reported that a new style of fire-fighter has been developed by Mr. H. H. Gorter, of the local fire department. It is designed to concentrate the streams from a number of lines of hose into one solid and powerful stream, something after the fashion of the water towers used by many fire departments, but more readily adapted to use in narrow streets, and capable of throwing the water to low as well as high points. The apparatus is really a large fire nozzle so mounted that its stream can be turned vertically by means of a ball-and-socket joint and horizontally on roller bearings. The apparatus is mounted on a one-horse cart, and requires fewer men and horses for its operation than the ordinary water tower. During the latter part of 1899 the Fire Department of New York City made arrangements to test search-lights for use on fire engines, designed to aid in lighting narrow, dark streets and to throw light through windows into buildings. The search-lights are mounted on each side of the driver's seat, and the projectors may be dismounted and set up on the ground. The Fire Brigade of Paris has recently secured an electrically propelled hose wagon with seats for six men. The apparatus was designed under the direction of Capitaine-Ingénieur Cordier. The motor is of 90 volts and 25 ampères, and it is expected that the battery will give some six hours' service.

The following statistics relating to fire departments in the ten largest cities of the United States are reprinted from the *Bulletin* of the Statistics Department of the city of Boston for September, 1899:

CITIES.	Cost of Maintenance and Operation.	Firemen.	Steam Engines.	Chemical Engines.	Fire Hydrants.	Fire Alarms.	Fires.	Property Loss.	Population.*	Area in Acres.
New York.....	.....	\$5,746	145	6	20,130	7,100	6,472	\$5,100,000	3,500,000	196,000
Chicago.....	†\$1,554,065	\$1,175	92	25	18,311	6,581	5,048	2,651,735	1,850,000	119,869
Philadelphia.....	1,004,169	736	46	5	11,000	2,586	2,484	1,653,902	1,240,266	82,933
St. Louis.....	742,323	501	46	25	6,300	1,918	1,797	907,090	623,000	40,000
Boston.....	1,170,998	1748	53	14	**7,065	1,980	1,099	1,441,261	582,463	27,596
Baltimore.....	475,855	397	28	30	2,113	1,373	1,298	878,592	541,000	24,171
Cincinnati.....	474,407	340	31	3	3,550	928	921	452,804	415,000	20,860
Buffalo.....	526,090	426	29	6	4,465	832	775	537,371	400,000	25,343
Cleveland.....	434,566	390	25	3	6,000	1,182	1,160	717,975	380,000	30,332
San Francisco.....	739,671	†597	46	9	3,528	887	878	818,259	360,000	27,000

* Estimated January 1, 1899.

† Not including data regarding sanitary district of Chicago.

‡ Including 3498 volunteers.

§ Including 108 volunteers.

|| Including 88 call-men.

¶ Including 397 call-men.

** Also 121 reservoirs.

See TALL BUILDINGS (paragraph Fire Protection).

FISH AND FISHERIES. The most important event of 1899 in the matter of fish and fisheries was probably the International Fisheries Conference at Stockholm in June. Although the questions considered did not concern American fishing interests, and our government had no part in the proceedings, yet the carrying out of the plans of the conference will prove of great interest to American scientists and fishermen, as well as to those of Europe. The conference was held at Stockholm, June 15-23, by invitation of the King of Sweden and representatives of Russia, Norway, Denmark, Holland, Germany, and Great Britain were present. The chief business was the drawing up of plans for a fisheries survey of the seas bordering on the countries represented. As finally adopted the report recommends a hydrographical and biological survey of the North Sea, the Baltic Sea, and parts of the Arctic and

North Atlantic oceans, under the auspices of the seven above-mentioned countries, France and Belgium being also invited to assist. Each country is to take charge of a certain portion of the area under observation, and it is hoped to have the work begin in the spring of 1901. While a large proportion of the work is physical or chemical, the plans for the biological survey are still quite extensive. The biological work, however, will be confined to a direct investigation of the fishes only, and other groups of animals are apparently not to be taken up. It is proposed to establish a central station to have charge of the work, and it is estimated that the cost of this office will be about \$24,000 annually. The report has called out a good deal of criticism in England on account of what seems to be two serious defects. In the first place, the biological investigations are too limited in their scope, and their programme is too vague, and furthermore those interested in British fisheries feel that a survey which does not include the English Channel and the Irish Sea is geographically too restricted to warrant the expense which the proposed plans involve.

There was no other important fisheries congress during the year, but the fishery boards of all countries have given additional evidence of their usefulness. The fishery board of Scotland, however, comes in for no little criticism in an important work by Professor W. C. McIntosh, entitled *The Resources of the Sea*. Dr. McIntosh is evidently opposed to restrictive measures, such as the prohibition or limitation of trawling and the closing of certain breeding areas. He thinks that fish reproduce with sufficient rapidity and in sufficient numbers, so that the number captured by man cannot permanently injure the species. This is certainly debatable ground, and many zoologists will probably question not only some of his conclusions, but the premises from which he draws them. Meanwhile the work that is being done by the Marine Biological Association at their Plymouth laboratory in connection with English fisheries seems to receive only favorable comment. During the summer of 1899 a most important report appeared from that laboratory, giving an *exact* account of the nature of the sea bottom and its fauna, on a selected strip near Plymouth, at a depth of from 28 to 35 fathoms. It is intended to make a similar careful survey of the bottom between the 30-fathom line and the shore. Another important contribution to the literature of European fisheries comes from the Bergen Museum, which has published a *Report on Norwegian Marine Investigations*. The first part deals with the hydrography and the plankton of the northern ocean, while the second part is given up chiefly to a consideration of the food of the cod, and is an important contribution to the natural history of that fish.

The United States Fish Commission.—The year 1899 has been one of great activity on the part of the commission, and in certain lines, at least, great advance is shown over the preceding year. The year ending June 30, 1899, showed a great increase in the total number of fish hatched and young fry set free. At the same time the scientific work of the commission has been prosecuted with unusual vigor. Never before have so many different localities been made the headquarters of fishery investigations. During the past summer these investigations have been carried on, as in the previous year, at Wood's Hole, Mass., and Put-in-Bay, O., and in addition at Beaufort, N. C., on the coast of Oregon, along the eastern tributaries of the Sacramento, in the Wabash basin, in the Monongahela basin in West Virginia, along the San Pedro River in Arizona, on Seneca Lake, N. Y., and in the Sebago and Cobbosseecontee Lakes in Maine. The commission has also united with Professor Alexander Agassiz in a very important scientific expedition in the Pacific, with the *Albatross* as headquarters. (See ZOOLOGICAL STATIONS, paragraph Albatross Expedition). The opening of a laboratory at Beaufort was an admirable step, and with Dr. H. V. Wilson as director the success of the season was assured. The commission's schooner *Grampus* and the steamer *Fish-Hawk* were at Wood's Hole most of the summer, and with the aid of the former further important investigations were made regarding the distribution of the tile-fish. The first four months of the year were spent by the *Fish-Hawk* dredging and collecting in the waters about Puerto Rico. Large collections were made in various groups of invertebrates, and have been distributed to specialists throughout the country. It is planned to issue the resulting reports as a special bulletin on the zoology of Puerto Rico. In September the *Fish-Hawk* went to Beaufort, where she has since been engaged in a biological and topographical survey of the oyster grounds of North Carolina. The season at Wood's Hole was a very successful one, remarkably so in the addition of a large number of species of fish to the known fauna of that region. These were chiefly obtained by seining in Katama Bay, at the east end of Martha's Vineyard. No less than 18 species were added to the list, bringing the total number of fishes known to occur in the vicinity of Wood's Hole up to 240, a larger number than is known from any locality in the United States, except Key West, where 250 species have been found. In one day 56 species were collected in Katama Bay, and 47 of these were at one haul of the seine.

The *Bulletin* of the commission has appeared in new dress, and is greatly improved in its appearance, while under the present administration of the commission its value as a scientific journal is greater than ever before. One of the most interesting of the recent publications of the commission is a memoir on *The Fresh-Water Pearls and Pearl Fisheries of the United States*, by Mr. G. F. Kuntz. It is an exhaustive history of the pearl fisheries in the United States up to 1898, and contains a mass of material which will be a surprise to most readers. The pearls are found in specimens of *Unio*, most commonly within the shells of *U. complanatus*. The industry dates from 1857, when the "queen pearl" was found in New Jersey. It was sold to the Empress Eugénie for \$2500, and is now said to be worth four times that amount. Tennessee, Kentucky, and Wisconsin seem to be the leading States in the industry. Since 1889 it is estimated that pearls worth over \$25,000 have been found in Wisconsin alone. The search for pearls has led to the destruction of the unios in some localities, and it seems probable that measures of some kind will have to be adopted to protect the industry. See ZOOLOGICAL LITERATURE; ZOOLOGICAL SOCIETIES (paragraph British Association).

FISHER, GEORGE PURNELL, ex-associate justice of the Supreme Court of the District of Columbia and ex-member of Congress from Delaware, died in Washington February 11, 1899. He was born in Milford, Del., October 13, 1817; was graduated at Dickinson College, 1838. He presided at the trial of John H. Surrat, who was charged with complicity in the assassination of President Lincoln. He was United States attorney for the District of Columbia, 1870, and first auditor of the Treasury, 1889.

FISHERIES SOCIETY, AMERICAN, organized in 1871, had in 1899 a membership of 235. General meeting for 1900 at Wood's Hole, Mass., second week in July. President, John W. Titcomb; corresponding secretary, J. E. Gunckel, Toledo, O.

FLAGG, REV. JARED BRADLEY, M.A., D.D., died September 25, 1899. Dr. Flagg was known as one of the earliest New York artists. He was ordained as an Episcopal minister in the early fifties, but he resigned from the ministry to devote himself to painting. He had studied as a boy in the studio of his brother, George W. Flagg, and afterward with his uncle, Washington Allston. Later he wrote a life of his uncle, which was published in 1892. At the age of sixteen Flagg painted a portrait of his father, which was exhibited at the National Academy, of which in 1849 he was elected a member. His portraits were features of the Academy exhibitions for many years. Among his figure pieces which attracted attention was "Hester Prynne in Prison." He was known chiefly as a portrait painter, among his canvases being a portrait of Commodore Vanderbilt, exhibited at the Centennial Exposition at Philadelphia in 1876. He painted a portrait, also, of William H. Vanderbilt, and other financiers were the subjects of his brush at various times. A picture of F. D. Tappan, president of the Gallatin National Bank, New York, is one of his latest and one of his best works. Dr. Flagg was granted his degree of Doctor of Divinity by Columbia. He studied at Trinity College as a youth, and was awarded an M.A. from that institution in 1861.

FLAGLER, Brigadier-General DANIEL W., chief of ordnance, U. S. A., died at Old Point Comfort, Va., March 29, 1899. He was born in New York, March 24, 1835; was graduated at West Point in 1861, and served through the Civil War. He served first in drilling volunteers in Washington, then was aide-de-camp to Colonel Hunter and to General McDowell, and was finally transferred to the ordnance department. He was assistant ordnance officer at the Alleghany arsenal; inspector of ordnance for the Mississippi River flotilla; chief of ordnance in General Burnside's North Carolina expedition; he served at the West Point foundry, and at the close of the war was in charge of the Tredegar Iron Works at Richmond, Va. He was brevetted captain for gallantry and meritorious services at Antietam, major at Fort Macon, and lieutenant-colonel for services rendered throughout the war. He participated in the following battles: Bull Run, Roanoke Island, Newburn, Fort Macon, South Mountain, Antietam, Fredericksburg, Chancellorsville, Gettysburg. For many years after the war he did excellent work in developing the Ordnance Department, serving at various arsenals throughout the United States. The order of these appointments was as follows: Watervliet Arsenal, New York; Augusta Arsenal, Georgia; Rock Island Arsenal, Illinois; Fort Monroe Arsenal, Virginia; Fort Union Arsenal, New Mexico; San Antonio Arsenal, Texas; Frankford Arsenal, Pennsylvania; and Watertown Arsenal, Massachusetts. In 1881 he became lieutenant-colonel of ordnance, and colonel in 1890. In the following year he was made chief of ordnance with the rank of brigadier-general. His service in this position, extending to the time of his death, was a notable success.

FLAX. The following statistics of the world's production of flax seed and flax fibre are published by the United States Department of Agriculture:

COUNTRIES.	SEED.			FIBRE.		
	1896.	1897.	1898.	1896.	1897.	1898.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
United States*	17,402,000	11,000,000	17,217,000	.....	.....	.....
Manitoba.....	287,500	253,500	305,500	.....	.....	.....
Mexico.....	108,000	222,500	811,000	.....	.....	.....
Argentina*	7,500,000	7,000,000	9,000,000	.....	.....	.....
Total America.....	25,277,500	18,478,000	26,833,500	.....	.....	.....
Sweden.....	70,000	73,500	175,000	4,138,000	3,917,000	4,223,000
Netherlands.....	312,000	275,000	1308,000	11,795,000	11,503,000	112,934,000
Belgium.....	384,000	350,000	1400,000	31,417,000	30,123,000	132,246,000
France.....	523,000	524,000	557,000	41,549,000	41,224,000	25,126,000
Italy†.....	.....	.....	.....	41,917,000	41,917,000	41,917,000
Austria.....	743,000	734,000	802,000	66,800,000	68,195,000	88,833,000
Hungary.....	245,000	230,000	250,000	11,972,000	10,629,000	14,939,000
Croatia-Slavonia.....	26,000	58,000	51,000	8,688,000	9,816,000	10,325,000
Total Austria-Hungary.....	1,014,000	1,002,000	1,103,000	107,460,000	108,640,000	114,097,000
Roumania.....	674,000	676,000	461,000	.....	.....	.....
Servia‡.....	.....	.....	.....	1,237,000	1,237,000	1,237,000
Russia.....	39,625,000	27,296,500	23,537,500	1,474,692,000	1,240,284,000	1,580,776,000
Total Europe.....	42,612,000	30,197,000	31,241,500	1,714,305,000	1,478,845,000	1,762,556,000
British India.....	14,795,000	8,839,500	17,839,000	.....	.....	.....
RECAPITULATION.						
America.....	25,277,500	18,478,000	26,833,500	.....	.....	.....
Europe.....	42,612,000	30,197,000	31,241,500	1,714,305,000	1,478,845,000	1,762,556,000
British India.....	14,795,000	8,839,500	17,839,000	.....	.....	.....
Grand Total.....	82,684,000	57,514,500	75,914,000	1,714,305,000	1,478,845,000	1,762,556,000

* Commercial estimate.
† Average for 3 preceding years.

‡ Average, 1892 to 1895.
§ Census 1898.

This table is not absolutely complete, as reports of the production in some countries are not available. There are no figures for the yield of Ontario, Canada, but the crop there seems to be steadily declining; the area under flax in 1898 was 10,720 acres. Also no estimates have been made of the German crop or of the Spanish crop, which seems to be of some importance. The Department of Agriculture, however, reports that for practical purposes the table is fairly complete.

FLETCHER, BANISTER, professor of architecture and building construction in King's College, London, was born in 1833 and died July 5, 1899. He was educated privately. He had a prominent position among English architects, and was one of the first to introduce faience work in street architecture. From 1875 to the time of his death he was district surveyor of West Newington and part of Lambeth. He had travelled widely on the continent. Professor Fletcher was a fellow of King's College and of the Royal Institute of British Architects. He published: *Sanitary Hints; Light and Air; Model Houses for the Industrial Classes; Quantities; Dilapidations; Arbitrations; Valuations and Compensations; London Building Art* (1894); and in collaboration with Mr. B. F. Fletcher, *History of Architecture*.

FLETCHER, THOMAS CLEMENT, ex-governor of Missouri, died March 25, 1899. He was born in Jefferson County, Mo., January 21, 1827; he studied law and was admitted to practice in 1857. In the Civil War he fought for the Union, was imprisoned for a time in 1863 in Libby, and was promoted to the rank of brigadier-general of volunteers. From 1865 to 1869 he was governor of Missouri. He will be remembered as the first speaker in the first Republican convention held in a slave State.

FLORIDA, the southernmost State of the United States, has an area of 56,680 square miles. The capital is Tallahassee. Florida was admitted to the Union March 3, 1845.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 5,093,370 bushels, \$2,699,486; oats, 320,454,

\$160,227; potatoes, 117,576, \$145,794; and hay, 8675 tons, \$133,161. Live stock, January 1, 1900, comprised, horses, 38,050, \$1,776,778; mules, 8521, \$610,096; milch cows, 113,108, \$1,888,904; other cattle, 299,712, \$2,512,036; and sheep, 76,074, \$128,870.

Industries.—The termination of war conditions in Cuba and the abolition of oppressive trade regulations maintained under Spanish authority gave Florida in 1899 a degree of commercial prosperity unknown for many years. This appreciation was strikingly manifested in increased bank transactions and railroad receipts, enlarged imports and exports, urgent demands for labor, cancellation of mortgages, and savings bank deposits. The first industry to be affected by the changed conditions was the phosphate. During 1898 the shipments aggregated nearly 555,000 tons. Of this, 340,000 tons were high grade, all of which went to foreign markets. The high-grade price did not average over \$5.50 per ton. In August, 1899, the quotations for future deliveries averaged \$9.75 per ton at the port. The supply in 1898 fell short of the demand, and in 1899, with more than 20 new plants and an estimated production of 100,000 tons in excess of the previous year, the supply was again insufficient. In ten months ending May 1, 1899, the exports of American phosphates amounted to nearly \$5,000,000. The United States furnishes about half the world's product, and Florida supplies the greater part of that half. During the fiscal year ending June 30, 1899, the collection of internal revenue on taxable manufactures aggregated \$682,422. There were 14 manufacturers of tobacco and 555 of cigars and cigarettes alone, and the production was 139,633,684 cigars, 6,224,920 cigarettes, and 28,026 pounds of smoking tobacco. Authoritative reports in November, 1899, concerning the orange crop in Manatee County, indicated an unusually rapid movement and an output of about 1,000,000 boxes. Much of the crop had been sold on the trees; all was of excellent quality; and growers were in high spirits over the good prices obtained.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Apalachicola, Fernandina, Key West, Pensacola, St. Augustine, St. Johns, St. Marks, and Tampa aggregated in value \$1,125,625, and the exports \$19,914,144, making the total foreign trade \$21,039,769, an increase in a year of \$8,333,524.

Railways.—The total new railway construction during 1898 was reported at 47.30 miles, and during 1899, 118.50 miles, giving the State a total mileage of 3219.15. The valuation of railway property, as computed for taxation in 1898, was \$18,547,535.

Banks.—On October 31, 1899, there were 15 national banks in operation and 10 in liquidation. The active capital aggregated \$1,150,000; circulation, \$366,477; deposits, \$5,960,637; and reserve, \$2,286,237. The State banks, June 30, 1899, numbered 20, and had capital, \$710,000; deposits, \$2,418,214; and resources, \$3,402,421. The exchanges at the United States clearing house at Jacksonville in the year ending September 30, 1899, aggregated \$11,528,154, an increase of \$691,975 in a year.

Education.—At the close of the school year, 1897-98, the school population was 171,100; enrolment in public schools, 108,455, and average daily attendance, 74,004. There were 2792 teachers, 2121 buildings used for school-houses, and public school property valued at \$755,824. The revenue was \$630,733; expenditure, \$668,242, of which \$559,856 was for teachers' salaries. There were 24 public high schools, with 68 teachers, 1054 secondary students, and 999 elementary pupils; 6 private secondary schools, with 17 teachers, 139 secondary students, and 1489 elementary pupils; 2 public normal schools, with 15 teachers and 295 students, and 3 private ones, with 19 teachers and 511 students. Normal training was also given in 4 colleges and 8 public high schools. Six colleges for men and for both sexes reported 6 scholarships, 80 professors and instructors, 810 students, 18,870 volumes in the libraries, \$19,000 invested in scientific apparatus, \$439,000 in grounds and buildings, and \$424,800 in productive funds, \$70,420 in total income, and \$213,765 in benefactions. In 1899 there were 168 periodicals, of which 17 were dailies, 125 weeklies, and 16 monthlies.

Finances.—The assessed valuations in 1898 comprised, real estate and railway and telegraph property, \$78,660,930; personal property, \$15,239,892; total, \$93,900,822, a decrease in a year of \$1,216,334, and the lowest total since 1890. The law now requires the assessment of taxable property at full cash value. The State tax rate for 1899 was \$5.50 per \$1000. On January 1, 1899, the total bonded debt was \$1,275,000, of which \$950,500 was held by State funds and the balance by individuals. All bonds held by individuals are to be refunded at maturity by act of the legislature in 1899. Of the interest-bearing notes for \$200,000 of borrowed money, the State paid off \$75,000 in 1898, and the school fund held \$100,000, and the internal improvement fund \$25,000.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 520,000.

Legislation.—In 1899 a State Bureau of Vital Statistics was created. The State Board of Health was continued, and was authorized to examine all lodging-houses containing ten or more rooms, and to regulate their sanitary condition. The gov-

error was authorized to appoint a State Board of Eclectic Medical Examiners to examine graduates of the eclectic schools only. The Railroad Commission was given enlarged powers, and can now fix rates. Common carriers must give ticket agents certificates of authority to sell tickets, and all other persons are forbidden to sell the same. It was made a misdemeanor for any person other than an employee to uncouple cars, handle brakes, or interfere with the operation of railroads. Firing of guns from trains was forbidden, and it was also made a misdemeanor to "beat one's way" on a railroad. A system looking to the uniformity of text-books was introduced.

State Officers and National Representatives.—Governor, William D. Bloxham; secretary of state, J. L. Crawford; treasurer, James B. Whitfield; comptroller, W. H. Reynolds; attorney-general, W. B. Lamar; adjutant-general, Patrick Houston; superintendent of public instruction, W. N. Sheats; commissioner of agriculture, L. B. Wombwell. Supreme Court: Chief justice, R. F. Taylor; associate justices, M. H. Mabry and F. B. Carter; clerk, B. B. Wilson. The State legislature consists of 100 Democrats. Senators: Stephen R. Mallory, from Pensacola, and James P. Taliaferro, from Jacksonville, both Democrats. Representatives: Stephen M. Sparkman, from Tampa, and Robert W. Davis, from Palatka, both Democrats.

FLOWER, ROSWELL PETTIBONE, ex-governor of New York, died at Eastport, L. I., May 12, 1899. He was the sixth of nine children, and was born at Theresa, N. Y., August 7, 1835. When Roswell was eight years old his father, a wool-carder, died leaving little means for the support of the family. The boy obtained his education at the district school and the high school. He taught for a time, and at the age of eighteen went to Philadelphia, where he was employed for a few months in the dry-goods business. He then went to Watertown, N. Y., where he secured a position in a hardware store, and soon afterward became deputy postmaster. Remaining in the latter position for six years at \$600 a year he saved money and entered the jewelry trade, in which he was successful, and in which he remained until 1869, when he went to New York, and soon found himself appointed executor of an estate left by his brother-in-law, Henry Keep, and amounting to about \$4,000,000. It was in this way that Flower was introduced to the New York financial world, in which he subsequently became a great power. Forming a partnership with E. C. Benedict, he opened a banking office in Wall Street, and later bought a seat in the Stock Exchange. In a few years this firm was succeeded by R. P. Flower and Company, at the head of which Flower increased his capital and showed such excellent judgment in matters of business and finance that he came to be a recognized power in Wall Street, and was made a director in various corporations—particularly of railroad companies. In 1881 he was elected as a Democrat to the Fifty-seventh Congress, defeating Mr. William Waldorf Astor. In 1884 he was looked upon as a very possible Democratic candidate for the Presidency. He was elected governor of New York in 1891, defeating Mr. J. Sloat Fassett, the Republican nominee. Even his opponents acknowledge that his administration was conducted on the principles of a capable and conscientious man of business. Among his more notable acts as governor may be mentioned his purchase of the Fire Island Hotel with his own money at the time of the cholera scare, the appointment of Judge Maynard to the Court of Appeals, and the sending of the State militia to Buffalo to suppress the riots of 1892. On January 1, 1895, he was succeeded as governor by Mr. Levi P. Morton, and thereupon resumed the management of his financial interests. He built the Flower (homœopathic) Hospital in New York; with his wife he built St. Thomas's House in Fifty-ninth Street, New York, affiliated with St. Thomas's Church; and, with his brother Anson, he built a church in Watertown, N. Y. He was a man of unusual public spirit, and it was said that for a number of years before his death at least one-tenth of his income had been devoted to benevolent purposes. Flower's death caused almost a panic in the stock market, the quoted value of those properties in which he was thought to have a controlling interest falling in some cases as much 30 per cent. The quick recovery of these stocks, however, "was in large measure a tribute to the great confidence of the business world in Mr. Flower's sagacity as well as his integrity." His death was probably hastened by the heavy strain upon him of his great business projects.

FLOWER, Sir WILLIAM HENRY, K.C.B., British surgeon, died July 1, 1899. He was born at Stratford-on-Avon in 1831; was educated at University College, London. During the Crimean War he served with distinction as assistant surgeon to the Sixty-third Regiment. He was assistant surgeon in the Middlesex Hospital from 1859 to 1861, and from the latter year to 1884 was conservator of the Museum of the Royal College of Surgeons, and from 1870 to 1884 was Hunterian professor of comparative anatomy. Dr. Flower was president of the Anthropological Institute from 1883 to 1885, director of the department of natural history in the British Museum from 1884 to 1898, and president of the British Association in 1889. Among

his writings are: *Introduction to the Osteology of Mammalia; Fashion in Deformity*, 1881; *Introduction to the Study of Mammals, Living and Extinct*, 1891; *The Horse, a Study in Natural History*, 1892; *Essays on Museums*, 1898.

FLUORSPAR. The production in 1898 amounted to 7675 short tons, valued at \$63,050, a gain in value of 70 per cent. over 1897. This product came entirely from Marion and Crittenden Counties, Ky. The American product is used in the manufacture of hydrofluoric acid and opalescent glass; also as a flux in iron smelting.

FLYING MACHINES. See AERIAL NAVIGATION.

FOLLETT, DAVID LYMAN, justice of the Supreme Court of New York, died at his home in Norwich, N. Y., July 5, 1899. He was born at Sherburne, N. Y., July 17, 1836; was educated at the Oneida Conference Seminary, studied law at Norwich, and in 1858 was admitted to the bar. He was appointed by President Johnson in 1867 assessor of internal revenue for the nineteenth district of New York, and served until 1873, when the office was abolished. The following year, as a Republican, he was elected to the Supreme Court. He was renominated in 1888 and endorsed by the Democrats for a second term of fourteen years. Upon gubernatorial appointment Judge Follett had served as associate justice of the general term, fourth department; chief justice of the Court of Appeals, second division, and associate justice of the general term, first department. In 1887 he was chosen by Governor Hill to revise in collaboration with David Dudley Field and Judge William Rumsey the proposed code of evidence. Governor Morton appointed him in 1895 to the appellate division, fourth department, which position he held at the time of his death.

FOODS. A suggestion has been made to pass special national laws which shall protect the public against adulteration of food, and for the appointment of a National Food Commission. Professor A. S. Mitchell has epitomized his testimony before a committee of the Senate of the State of Wisconsin, as follows, pointing to some of the dangers that now threaten health: "That as chemist of the Wisconsin Dairy and Food Company for the past four years I had been engaged in investigating the character of the foods on the market. That before the passage of a State food law extensive adulteration of spices, syrups, honey, flavoring extracts, and baking powder was being practised. That special previous laws had done much to control similar adulteration in vinegar and dairy products.

"That adulteration might be discussed under two general heads. The adulterants may be simply fraudulent, or they may be injurious or deleterious; the injurious substances generally being used simply for coloring, or for masking fraudulent sophistication, or as chemical preservatives. That in my opinion the rapidly increasing use of preservatives was a menace to public health and should be regulated.

"That in former days foods were preserved by aid of sugar, vinegar, and salt, all of which are proper constituents of food, or were kept by boiling or the use of ice. That at present chemicals were not only purchased under their own names for use in foods, but that antiseptics were placed upon the market under fanciful titles and accompanied by false and misleading statements of their properties.

"Quart packages of 'Freezine' and 'Special M Preservaline' were shown the committee, with the false statements on the label of the former, stating that it acts the same as ice, and that as it is a gas it escapes and leaves nothing in the milk, and that it cannot be detected by the chemist. The substances were stated to consist wholly of solutions of formic aldehyde. Its properties and uses were then described. I stated that other similar preservatives were on the market, and were much used by milkmen, especially in warm weather, and by those shipping milk by rail to the large cities. I gave it as my opinion that it did not 'act like ice,' that it was a powerful antiseptic, and deleterious in any amounts, and that its use was highly objectionable; that if cleanliness was exercised in the care of milk and it was properly aerated and cooled, its use was not necessary. 'Cream Albumenoid,' consisting of gelatine, boric acid, and borax, was shown as sold for use in 'improving' cream. 'Laketone,' a solution consisting of sulfonated anilin yellow, used for coloring milk and cream, was produced and discussed.

"The very common use of salicylic acid for preserving cider was referred to. (I have found grape-juice of a standard make and recommended for the use of invalids with weak stomachs to be heavily salicylated.)

"The use of salicylic acid in bottled beer was referred to.

"I stated that in my opinion a desirable policy would be to prohibit the use of all deleterious substances in all amounts, except in such cases as the substances were necessary ingredients in the manufacture of the product. For example, where there is a choice of yellows for butter colors, flavoring extracts, and confectionery, harmless vegetable colors must be used in preference to the brighter and more penetrating coal-tar colors.

"I then showed preparations of sodium sulfite, intended for use in chopped meat and hamburger steak. 'Rosaline,' a colored mixture of borax, nitre, and salt, sold for use as a sausage color and preservative, was shown.

"After a somewhat lengthy discussion of jellies, syrups, baking powders, and various food products, I strongly recommended national food legislation and the establishment of a National Food Commission.

"Such a commission would not only prevent the sale of injurious and deceptive goods, but it and the national law would serve as a model for State legislation, tending to uniformity in the various States. As it is at present, while the State officers can reach and control the manufacture of food products within the State, they cannot reach dishonest manufacturers shipping goods in from the neighboring States, but are forced to hold the retailers responsible."—*Philadelphia Medical Journal*.

FOOTBALL. The football season of 1899 furnished many genuine surprises and was full of opportunity for ambitious teams to improve their rank. The settlement of the collegiate championship was a question of unusual interest, owing to the complexity of the scores and the consequent difficulty of team classification. The most important results of the year were the notable improvement in play among the colleges at large and the consequent evening up of ranks, and the development of the game to a higher plane of sportsmanship than ever before. The widespread development of the game in 1899 compelled recognition not only of the growth of team work in the East generally, but of the rate at which the Western and middle-Western colleges are coming to the front. More intersectional games than usual were played, including a game for the first time between institutions of the Atlantic and the Pacific States. The solidity of the so-called "big four"—Harvard, Princeton, Yale, and the University of Pennsylvania—was threatened at various times during the season by several of the teams of the second class, which have for a number of years been knocking for admission into the first group. Cornell was ambitious in 1899 to lay claim to a higher rank even than that of the year before; Lafayette was also an important factor in the season of 1899, while the rise of Columbia in a single year to a position commensurate with her football prestige of some years ago was an unexpected feature of the season, and further complicated the question of the final rank of the more important Eastern teams. Brown and the Carlisle Indians also made an exceptionally good showing.

Harvard, by her generally consistent work, with not a defeat, was conceded the first position in the football world until the very end of the season, when her tie game with Yale, 0 to 0, and the defeat of the latter college by Princeton, 10 to 11, introduced a rival for championship honors. The placing of other teams furnished endless speculation. Cornell lost rank through her defeats by Lafayette, 6 to 5, and Pennsylvania, 29 to 0, and the season's rounding out of Princeton and Yale placed her at fifth place, although she had defeated Princeton, 5 to 0, and beaten Columbia, 29 to 0, who had defeated Yale, 5 to 0. Second place was later in the season claimed by Lafayette, by virtue of her defeating Cornell, and Pennsylvania, 6 to 0, and by proxy Princeton and Yale. Columbia having defeated Yale and doubled the score made by Harvard, Princeton, and Yale against Dartmouth, also felt entitled, until decisively beaten by Cornell and the Indians, 45 to 0, to a high place. These teams—that is, Columbia, Cornell, and Lafayette—are conceded fifth place, critics differing as to the relative rank of the three. The inconsistency of playing with relative scores has perhaps never been so well illustrated as in 1899. Thus, the end of the season, after a long period of newspaper discussion, found the personnel of the "big four" unchanged. There are differences of opinion among even the best critics as to the relative ranking of the remaining teams. The matter is in a way trivial compared with the more important and highly satisfactory increase in good football played during the year, but it is nevertheless a subject of some interest. Combining the various opinions of football critics, the order of Eastern teams is something like this: 1, Harvard, Princeton; 3, Yale; 4, Pennsylvania; 5, variously assigned, Cornell, Lafayette, Carlisle Indians, and Columbia; 9, Brown; 10, West Point; 11, Annapolis; 12, Wesleyan. Owing to certain eligibility rules, principally as to the number of years a man may play, which differ from the rules adopted by the college teams, some critics exclude West Point, Annapolis, and Carlisle from the intercollegiate list. Columbia should also be omitted in 1899, since she did not conform to certain accepted intercollegiate rules as to the personnel of her team. The spirit of her play was otherwise fully up to the average.

The colleges of the middle West played six games with Eastern colleges. The University of Chicago tied Pennsylvania, 5 to 5, and defeated Cornell, 17 to 6, and Brown, 17 to 0; Wisconsin was beaten by Yale, 6 to 0; Michigan defeated Virginia, 38 to 0, and was beaten by Pennsylvania, 10 to 11. Chicago had the strongest team of the middle West, winning her seven games in the Western League and being scored against only by Notre Dame and Iowa State universities. Wisconsin won

all her Western games but one, losing to Chicago, 17 to 0. In the far West the University of California defeated Leland-Stanford University, and later the Carlisle Indians crossed the continent and defeated the California team by a score of 2 to 0. In the New England League games among the four principal smaller colleges, Wesleyan was most successful, defeating Dartmouth, 11 to 0; Amherst, 40 to 0; and Williams, 11 to 5. In the far South football showed a decided advance in 1899. Sewanee University had by far the best team, comparing favorably with the smaller teams of the North.

The most prominent non-collegiate elevens were those of the Carlisle Indians, West Point, and Annapolis. The red men put to rout both Pennsylvania, 16 to 5, and Columbia, 45 to 0; and though defeated by Princeton, 12 to 0, and Harvard, 22 to 10, gained two goals against the latter. The West Point Military Academy and the Annapolis Naval Academy, each of which contested with various college teams, were in 1899 permitted by the War Department to meet each other in football for the first time in several years. The game was played at Franklin Field, Philadelphia, by the courtesy of the University of Pennsylvania, and was attended by unusually distinguished spectators, including many State officials and prominent alumni of the two institutions. In one of the cleanest games of the year the army defeated the navy by 17 to 5. The result was a surprise, and was largely due to the able coaching received by West Point.

Some games not mentioned in the above account: Harvard beat West Point, 18 to 0; Brown, 11 to 0. Princeton beat West Point, 23 to 0; Brown, 18 to 6; Annapolis, 5 to 0; Lafayette, 12 to 0; Columbia, 11 to 0; Pennsylvania State College, 12 to 0. Columbia beat West Point, 16 to 0. Yale beat West Point, 24 to 0; Pennsylvania State, 42 to 0. Pennsylvania tied Brown, 6 to 6; lost to Harvard, 16 to 0, and beat Virginia, 33 to 6, and Pennsylvania State, 47 to 0.

FORCE, General MANNING FERGUSON, commandant of the Ohio Soldiers' and Sailors' Home, died May 8, 1899. He was born in Washington, December 17, 1824; was graduated at Harvard in 1845; studied at the Harvard Law School, and was admitted to the bar in Cincinnati in 1850. Being appointed major in the Twentieth Ohio Volunteer Infantry in August, 1861, he served through the Civil War, rising to the rank of brigadier-general, U.S.V., and major-general by brevet. From 1867 to 1877 he was judge of the Court of Common Pleas for Hamilton County, O., and from the latter year to 1887 he was judge of the Superior Court in Cincinnati. From 1878 to 1888 General Force occupied the chair of equity and criminal law in the Cincinnati Law School. He was commandant of the Ohio Soldiers' and Sailors' Home from 1889 to the time of his death. Among his writings are: Pamphlets on the Mound Builders and Indians; *The Letters of Vespuccius*; *Army Topics*; *From Fort Henry to Corinth*; *Notes to Walker's American Law*; *Notes to Harrison's Criminal Law*.

FORD, DANIEL SHARP, editor and proprietor of the *Youth's Companion*, died in Boston, December 24, 1899. He was born in 1822. While a young man he published and edited, with the late Rev. Dr. John W. Olmstead, the Baptist weekly known as *The Christian Watchman and Reflector*. In 1857 they purchased from Nathaniel Willis, father of the poet, N. P. Willis, the *Youth's Companion*, a juvenile paper founded by Mr. Willis. Mr. Ford, while acting as editor of the *Companion*, devoted his efforts toward publishing also the *Watchman*, which he was ambitious to make the leading religious paper in the country. Differences between the partners as to policy led to an amicable separation of interests, and the division, which was by lot, gave the management of the *Companion* to Mr. Ford. The name Perry, Mason and Company, under which the *Companion* is still published, is a purely fictitious firm name, adopted under the original partnership in order to avoid confusion of accounts. To Mr. Ford is due the development and present standing of the *Youth's Companion*, which in influence and circulation is to-day one of the leading juvenile papers of the United States.

FORD, Sir FRANCIS CLARE, G.C.B., G.C.M.G., British ambassador at Rome, died January 31, 1899. After his military service from 1846 to 1851 he entered the diplomatic service in 1852. He was the British agent for the commission at Halifax in 1875-77, under the twenty-second and twenty-third articles of the treaty of Washington. He was minister to Argentina in 1878-79, and in the latter year to Uruguay; in this year he was appointed minister to Brazil, serving until 1881. He was then transferred to the ministry at Athens, where he remained three years, being appointed in 1884 minister to Spain. While holding this position he was raised to the rank of ambassador in 1887, and five years later was transferred to the embassy at Constantinople. The following year he was appointed ambassador at Rome, which position he retained to the time of his death. During his service in Greece he was appointed (1883) British commissioner at Paris for the settlement of the Newfoundland fishery question. He was created a knight in 1889.

FORD, PAUL LEICESTER, author, was born in Brooklyn, N. Y., in 1865. He was educated privately, and has been an extensive traveller through North and South America and Europe. He has edited the *Writings of Thomas Jefferson* (ten volumes); the *Writings of John Dickinson* (three volumes), and other works relating to American history and bibliography. Publications: *The Hon. Peter Stirling*; *The Great K. & A. Train Robbery*; *The Story of an Untold Love*; *The True George Washington*; *Honors Are Easy* (staged by Charles Frohman); *Life of Franklin*; *Tattle-Tales of Cupid*; and *Janice Meredith*, one of the most successful novels published in 1899.

FOREIGN MISSIONS, AMERICAN BOARD OF COMMISSIONERS FOR, was organized in 1810, and is the oldest foreign missionary society in the United States. It had in 1899 a total missionary force of 3684, of whom 529 were from the United States, the remainder being native assistants. The latter number includes 343 women. There are 20 missions in Africa, Turkey, Ceylon, China, Japan, Sandwich Islands, Micronesia, Mexico, Spain, Austria, and India, the last named having 25 stations. There are 492 churches and 170 ordained missionaries, of whom 17 are physicians. The receipts for the last fiscal year were \$644,200. President, Samuel B. Capen; district secretaries, C. C. Creegan, D.D., 105 East Twenty-second Street, New York, and Rev. A. N. Hitchcock, D.D., 153 La Salle Street, Chicago, Ill.

FORESTIER-WALKER, Sir FREDERICK WILLIAM EDWARD, lieutenant-general in the British army, was appointed in August, 1899, to the command of the forces in South Africa to succeed Major-General Sir William F. Butler, who, it was said, had not been entirely in harmony with the policy of High Commissioner Sir Alfred Milner. General Forestier-Walker was born in 1844; educated at the Royal Military College, Sandhurst, he entered the Scots Guards in 1862. In the Kaffir war of 1877-78 he served as assistant military secretary, and during the Zulu war of 1878-79 as military secretary to Sir Bartle Frere; in the Bechuanaland expedition of 1884-85 he was assistant adjutant and quartermaster-general. He commanded an infantry brigade at Aldershot in 1889-90, and then the forces in Egypt until 1895. From the latter year until his appointment to South Africa he was in command of the Western District. He is a Knight Commander of the Bath and a Companion of St. Michael and St. George.

FORESTRY IN THE UNITED STATES. Attention to forestry conditions and needs in the United States has been aroused only in very recent years, but at the present time there is a widespread and growing interest in the subject. The reaction from the spirit of indifference to the rapidly wasting woodlands of the nation has come none too soon, for with the growth of the country and the development of its industries great inroads have been made upon the forests, and a market created which calls to-day for a round 40,000,000,000 feet of lumber a year. Seventy-five per cent. of this is of coniferous wood, which requires over three-quarters of a century to grow to maturity. The United States geological survey estimates that the present extent of forests in the United States is approximately 1,094,496 square miles, or about 37 per cent. of the area of the country, exclusive of Alaska. Seven-tenths of all the forests in the United States, it is estimated, are in the region between the Atlantic and the Mississippi. Of the remainder about one-tenth are in the interior Western States, one-tenth along the Rockies, and one-tenth on the Pacific coast. The latter region contains some of the largest trees in the world, and on the northwest coast are some of the densest forests of the temperate zone. Regarding the distribution as to States, Texas has the greatest extent of forests, about 64,000 square miles, although it also contains a great treeless area as large as the State of Pennsylvania. Next follow Oregon, Minnesota, and Arkansas. In relative amounts of timber Arkansas leads, with 84 per cent. of its area wooded, followed by Maine, Alabama, West Virginia, and North Carolina.

Forestry Principles.—Although the forests of the United States are disappearing at an alarming rate, they are still capable, under proper management, of filling for a long time the demands which may be made upon them. That such care has not been taken in the past is due both to ignorance and indifference regarding forestry needs, while existing opposition to the application of forestry principles is due to much the same causes. Recent discussions and events, however, have tended to make more clear to the people of the United States that forestry is in fact one of the economic arts, relying on the one hand upon unchangeable natural laws for the production of its crop, and on the other hand upon the settled economic laws and the principles of business. That applied forestry is a business is proved by the results in Europe, where it has been practised for over a century. Prussia spends annually about \$8,000,000 on her public forests, from which the income is about \$14,000,000; in France and Algeria the income is \$6,000,000, with an expense of \$3,500,000. It is also peculiarly a business for the state, since in America especially it must produce values for the future rather than for the present, with a decrease of present possible

profits. In order to bring about in this country results similar to those in Germany, for example, with its nine forestry schools, four of which are connected with universities, it is evident that we must utilize a corps of trained specialists, who shall enjoy equal prestige with those abroad. That provision has been made for the preparation of such at three large American universities within the period of 1898-99 is one of the most noteworthy and satisfactory steps ever taken in this country in the direction of forestry progress.

The National Forestry Policy.—The widespread interest in forestry problems and its rapid growth is shown by the creation during 1891-99 of 37 national forest reservations, with an estimated area of 46,021,899 acres, and proposals pending at the close of 1899 for nearly fifty additional reserves. The established reserves include the forest reservations proper and the national parks. The latter, in which lumbering is entirely prohibited and the game animals fully protected, include the Yellowstone, Yosemite, Sequoia, Mount Ranier, and General Grant national parks. As one result of the general and healthy interest manifested, the policy of establishing forest reserves is now, according to the 1899 report of the United States division of forestry, established beyond the reach of further question. After the bitter opposition which manifested itself against such a policy in very recent years this is a notable triumph. One of the consequences of the controversy, however, has been the disposal of the responsibility for these reserves among three different government bureaus—namely, the general land office and the geological survey in the Department of the Interior, and the division of forestry in the Department of Agriculture. The first administers and protects the reserves, the second maps and describes them, and the third, in which are all the trained foresters in the government service, has no relation whatever to this important branch of forestry work, according to the 1899 year book of the Department of Agriculture, except as the Department of the Interior may apply for assistance or advice. The connection of the United States geological survey with the forestry reserves will cease with the completion of its survey, but the complete separation which exists between the general land office and the force of trained foresters in the division of forestry in their relation to the reserves constitutes, according to the chief of the division, a serious defect in the organization of the federal forest work.

Work of the Division of Forestry.—The division of forestry, though not concerned with the immediate administration of the national reserves, became in 1898-99 an active organizer of practical forestry work in the woods throughout the United States, it alone among the three bureaus under discussion being held responsible for the progress of the science and art of forestry, and for the interests which are involved in the spread of conservative forestry over the enormous private holdings in the United States. The work of the division is carried on along four special lines. The first of these offers practical assistance to farmers, lumbermen, etc., in handling their forest lands. Applications were received during 1899 from 123 owners in 35 States for the management of 1,513,592 acres, of which 48 applications were for large tracts, covering together 1,506,215 acres, the remainder being for wood lots. Personal attention on the ground was given to 41 tracts, covering about 400,000 acres in 19 States. The working plans furnished to the owners were in a majority of cases carried out without further assistance, but 15 of the tracts received the active aid of the division, among the most notable being the Webb and Whitney preserves in the Adirondacks. A second line of work is the study and practice of economic tree planting, in especial relation to the treeless regions, and the study of commercially valuable trees. The loblolly pine in North Carolina, the red fir in Washington, and the coast redwood in California were among the more important trees considered in 1899. A third line is that of special investigations, which related in 1899 to forest fires, forest sections studied by local specialists, historical studies in State forestry progress, national forestry, and photographic forest description. See further regarding national forestry the article LANDS, PUBLIC (paragraphs on the Public Forests).

State Forestry.—Fourteen States exercise control of a more or less general nature over their forests—namely, Colorado, California, Kansas, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, and Pennsylvania. Various forestry associations have been instrumental in advancing the spread of knowledge, particularly the American Association in Ohio, the Pennsylvania Association in Pennsylvania, the Boone and Crockett Club in New York, the Sierra Club, and the Water and Forest Society in California, the Mazama Mountain Club in Oregon, and the Massachusetts, Wisconsin, Minnesota, and Colorado Associations. Schools of forestry are soon to be established at the State University in California, and at Yale in Connecticut, and one was opened in New York in 1898, at Cornell. The Yale school will have a large demonstration area in Pennsylvania. The California school is endeavoring to obtain the management for a term of years of the new Lake Tahoe national forest reservation.

Progress, Especially in New York.—Consideration of the forestry progress of

New York is of value, because that was the first State to establish a forestry department and to place the forests under systematic management and control, and among the first to create a forest reservation, while it has instituted the beginning in the United States of professional teaching of forestry. The forests of New York cover nearly 12,000,000 acres of woodlands, of which over 3,500,000 acres are in a single tract, in the Adirondacks, and nearly three-fifths as much in the Catskills. The whole of its forests were practically granted away before and soon after the Revolutionary War, but in 1872 a few thousand acres, principally in the Adirondacks, had reverted to the State through tax sales, though in widely scattered lots. In that year the first step was taken to establish the Adirondack Park in a commission headed by ex-Governor Seymour. Verplanck Colvin, a member of the commission, who was one of the originators of the scheme and among the first to explore and describe the region, then almost unknown, has carried on the State's important Adirondack survey since that date. A second step was the refusal to further sale of State lands in the forest counties, and a third most important move the successful efforts of Governor Black in 1897 to increase the State holdings. Governor Black reported that there were over 1,250,000 acres of Adirondack forests "subject to fire and axe, and a yearly devastation appalling and disgraceful." In the previous year alone (1896) there had been cut nearly 184,385,000 feet of spruce, nearly 59,000,000 feet of hemlock, nearly 18,000,000 feet of pine, and about 9,000,000 feet of hardwood. Pulp mills took cord-wood equivalent to about 160,000,000 feet board measure, making a total of over 430,000,000 feet cut in the North Woods in one year, besides 37¼ million pieces of shingle and laths. Through Governor Black's efforts the State's Adirondack holdings were increased, by appropriations of \$1,500,000, to include up to the close of 1899 about 1,177,630 acres, or, including land purchased but not yet conveyed, 1,230,889. In the Catskills the area was increased to 58,386 acres, or 74,144, including land yet to be conveyed. The Hudson, Mohawk, Black, and Delaware rivers and the Erie and Champlain canals are fed from these sections, and power furnished to important industries, including the largest pulp mill in the world. In 1899 Governor Roosevelt furthered the policy inaugurated by Governor Black. The much-criticised law forbidding cutting on State lands has been caused solely by the selfish and rapacious methods of lumbermen. In order to bring about such intelligent lumbering as shall make possible the eventual opening up of the lands to careful cutting, plans were proposed in 1899 for forestry experiments, the first introduction of practical forestry among any State forests. Plans were submitted to the governor by the Boone and Crockett Club, and a special report was prepared by Mr. Gifford Pinchot, chief of the United States division of forestry. Other matters of discussion in 1899 were the probable appropriation early in 1900 of \$500,000 for further State purchases, and the announcement by the governor that a new and more effective fish, game, and forestry board would soon be appointed.

The First American Forestry School.—One of the most noteworthy courses of action taken by New York was in the establishment in 1898 of the State College of Forestry, the first institution of the kind in this country, for which reason a discussion of its objects and methods may be useful. This school has been removed from politics by being placed under the care of Cornell University, and it is given a period of thirty years in which to demonstrate the value of scientific forestry on a demonstration area of 30,000 acres, located in Franklin County, in the Adirondacks. Its objects are: (1) To train scientific foresters; (2) to obtain such knowledge by experimentation, etc., as may be applied in time to other and especially to State forest properties. The college offers a four years' course of prescribed and elective work, leading to the degree of Bachelor of the Science of Forestry (B.S.F.). The standard is high, requiring for entrance the same conditions as for entrance to the academic department of the university, including advanced preparation in linguistics and mathematics. This is partly due to the existence of forestry literature mostly in French and German, the desirability of Latin for technical nomenclature, and the knowledge of mathematical methods required in forest mensuration, statics, finance, etc. There are provided about 45 required and elective courses in mathematics, physics, chemistry, botany, entomology and invertebrate zoology, physiology, vertebrate zoology and neurology, geology, mineralogy and meteorology, political economy, civil engineering and topography, law, pisciculture, and forestry. The last named comprises courses which treat of economical and political aspects, silviculture, forest protection, timber physics and wood technology, exploitation and forest mensuration, regulation, administration, valuation, statics, finance, etc. The last year of the course includes seminary work and original research where possible. The college faculty, under the directorship of Mr. Bernard E. Fernow, former chief of the United States division of forestry, is supplemented by the teaching aid of about thirty heads of departments in the university, and the lecture rooms, laboratories, and museums of the university are thrown open to students in the college. One of the most important parts of the course is the summer field-work

on the college tract in the Adirondacks. The second object of the college, the gaining of experience for the State, is largely carried on in this tract. It is expected that it shall be made to pay from the beginning, but its main object is to serve as an experimental laboratory and for the presentation of object-lessons. After thirty years it is to be turned over to the State. It is hoped to demonstrate how wild woods may be treated, cut, and utilized; how waste places may be planted, young growth encouraged, and partly timbered areas made to reproduce the crop cut; how to secure a market and to transport and market woods cut; to insure a regular supply and to contract for a regular market, and to make the tract self-supporting by economy and systematic business methods, with the idea always in view of keeping the wood tract a permanent forest; also to study and to fight forest fires and to solve as far as possible problems at present unsolved.

Private Forestry.—Practical forestry in the United States began on private lands, the most notable instance being the systematic management introduced by Mr. George W. Vanderbilt among the forests of his estate at Biltmore, N. C., beginning in 1892. Practical government assistance to private landholders began in 1898, when the division of forestry took up the work already referred to in a preceding section of this article. According to the 1899 report of that department, the total area for the management of which assistance had been asked of the government was on December 31, 1899, more than 2,000,000 acres. Lumber companies and associations, as well as individuals, it is stated, are directing their attention with increasing seriousness and frequency toward practical forestry.

Forest Administration, etc.—The best forest fire laws outside the national domain are stated to be those of Maine, New Hampshire, Minnesota, New York, Pennsylvania, and Wisconsin. In New York each forest-reserve township has a fire warden and two or more district wardens, and these may call when necessary upon any citizen of the State to aid in fighting the forest fires. Minnesota has laws somewhat similar. The administration of the national reserves is treated for the year 1899 in the article LANDS, PUBLIC (paragraphs on the Public Forests.) Statistics of forestry proper are still somewhat general. In the preparation of this article the reports of the United States departments of agriculture, geology, and forestry, the New York forestry commission, land survey, and state forestry college, and other sources have been consulted.

FORMALDEHYDE. See INSECTS; SANITATION.

FORMOSA, an island lying off the coast of China, was ceded to Japan by China at the close of the Chino-Japanese war, in 1895. Its area is 13,541 square miles, and its population about 2,000,000. Formosa, which is about 200 miles long, is very mountainous, and certain portions of the interior are almost inaccessible. There live in those sections a primitive race of Malay origin. Formosa has several important coast cities, four of which are open to foreign trade. Besides having a commanding position, Formosa has been a valuable acquisition to Japan because of its products, which include tea, sugar, rice, and camphor. It has developed a large tea trade with the United States during the past quarter century, which has been greatly increased by the supplanting of Amoy (Chinese) Oolong tea by the Formosan Oolong. The production of this tea has been greatly stimulated in Formosa recently, and the appointment of a Japanese commission empowered to oversee the market has resulted in preventing the adulteration of the article, a practice which grew out of the prosperity of the trade. Japan has shown considerable activity in developing internal communication in the island since her acquisition of that territory, and many good roads have been built. The administration, which at first was faulty, was reorganized in 1897, after a native revolt, and the Japanese officials were enjoined to gain the good-will of the inhabitants by fairness and benevolent treatment.

FORTNUM, CHARLES DRURY EDWARD, D.C.L., a well-known collector of antiquities and a trustee of the British Museum, died March 6, 1899. He was born March 2, 1820, and was educated privately, becoming later an honorary fellow of Queen's College, Oxford. In 1840 he went to South Australia, where he made a natural history collection, and having returned in 1845, he travelled on the continent, where he pursued various studies and collected antiquities and works of art. In 1887 he presented to the Queen the diamond signet of Queen Henrietta Maria, and in the following year gave part of his collection to the University of Oxford. In October, 1897, he presented to the Queen the gold and sapphire signet ring of Queen Mary II. Among his publications are: *Catalogue of Maiolica*, 1872, and of *Bronzes*, 1876, in the Kensington Museum; various articles on *The Queen's Gems*, 1876; *The Diamond Signet of Henrietta Maria*, 1882; a historical treatise on *Maiolica*, 1896; *Early Christian Rings and Gems*.

FOSSIL BOTANY. A most important discovery has been the finding of plants of the Dakota group of the cretaceous in southeastern Argentina. These have been

known in the United States, and this new discovery indicates a wide distribution of this flora.

FOSTER, ADDISON G., United States Senator from Washington, was elected as a Republican by the legislature to succeed Senator John L. Wilson, Republican, February 1, 1899. Mr. Foster was born at Belchertown, Mass., in 1837. While a child he was taken to Oswego, Ill., and subsequently went to Minnesota, where he taught school and later entered the grain and the real estate business, in which he was engaged from 1859 to 1875. At one time he was auditor and surveyor of Wabasha County. After securing interests in timber lands he removed to St. Paul, where he resided a number of years, and then to Tacoma, Wash., his present home. In that State he has had an active interest in coal-mining and railway building, and at the time of his election to the Senate was vice-president of the St. Paul and Tacoma Lumber Company. His term will expire March 3, 1905.

FOSTER, BIRKET, English artist, died March 28, 1899. He was born at North Shields, February 4, 1825; was educated at Tottenham and Hitchin. In 1841 he became a pupil of E. Landells, the wood-engraver, by whose advice he became a draughtsman. In the early part of his career he illustrated many books, chiefly poetry, and did many drawings for the *Illustrated London News*. Among the books he illustrated were Goldsmith's works, Beattie's *Minstrel*, and Longfellow's *Evangeline*. In 1858 he abandoned illustrating, and devoted himself to painting in water color. In 1860 he was elected to the Royal Society of Water Colors, and subsequently gained distinction as an aquarellist. He published *Brittany*, a series of thirty-five sketches, and *Some Pages of Note in England*, a series of twenty-five drawings.

FRANCE has an area of 204,092 square miles, and a population, according to the census of 1896, of 38,517,975 inhabitants. The population includes 1,027,491 resident foreigners, most of whom are Europeans. The colonies, protectorates, dependencies, and spheres of influence of France have a total area estimated at 3,617,327 square miles, and an estimated population of 52,643,000. A notable fact regarding the population of France proper is its slow rate of increase, and this small increase is due mostly to immigration. There is a small preponderance of births over deaths, the figures for 1897 showing an excess of 119,000, but this difference is due to a falling off in the death-rate and not to any great increase in the number of births. The figures for 1899 show an increase of deaths of 59,054, and a decrease of births of 15,174. The emigration from France is small. There has been no religious census in France since 1872, but the three strongest sects at the present time are Roman Catholics, Protestants, and Jews. While religion is free, any sect which numbers 100,000 adherents is entitled to an annual grant of state money, and this was apportioned in 1899 as follows: Roman Catholics, 41,085,923 francs; Protestants, 1,495,100; Jews, 206,530. Nearly two-thirds of the French Jews reside in Paris. The populations of the principal cities of France, census of 1896, are: Paris, 2,536,834; Lyons, 466,028; Marseilles, 442,239; Bordeaux, 256,906; Lille, 216,276. Seven other cities have between 100,000 and 150,000 inhabitants.

Production.—In the production of two important articles, wheat and wine, France stands at the head of the list of European countries. The grape is cultivated to a very great extent, and yielded in wine nearly 710,212,000 gallons in 1898. In 1899 the French output of wine was increased to an amount estimated at 825,089,298 gallons. Some 250,000,000 gallons of cider were also made. In wheat France raises nearly one-seventh of the world's supply, being the largest European wheat-growing country. In 1898 France produced 372,049,474 bushels out of 2,806,076,700 bushels grown by the world at large. In 1899 French wheat amounted to 346,600,554 bushels, a falling off of 25,098,963 bushels from the previous year, but an amount sufficient to meet the general needs of consumption in France, owing to the amount of unconsumed stock of old wheat. The world production of wheat also shows a falling off for 1899, the figures being 2,515,000,500 bushels. This is the normal figure, the yield of 1898 being unusually large everywhere. France consumes much of her wheat, although she also exports quite largely. She imports to some extent, especially in hard wheat. The imports of the latter were about 4,250,000 bushels in 1899. In extent of cultivation the principal crops of France are as follows, the estimate being based on figures for the year 1897: Grains—Wheat 6,583,776 hectares, oats 3,990,565; rye 1,451,754, barley 857,911, maize 584,959, buckwheat 552,299, mixed corn 239,725; green crops—meadows and pasture 5,601,156, vineyards 1,623,567, potatoes 1,548,464, clover 1,119,335, beet root 439,139, sugar beet root 269,715, colza 52,342, hemp 32,843, flax 24,474, tobacco 16,831. See AGRICULTURE (paragraph Agricultural Teaching).

Industries and Commerce.—From a résumé of the commercial progress of France during the past thirty years, published in the *Bulletin de la Société de Géographie Commerciale*, there are given the following facts: The French postal traffic has nearly doubled; the telegraphic net is almost ten times greater; the tonnage of the

railroads has almost doubled; the number of travellers has tripled; the receipts have increased almost \$100,000,000; the discounts at the Bank of France have risen from \$1,279,204,000 to \$1,663,853,000; deposits in savings banks have increased from \$144,750,000 to over \$572,000,000, and deposits in banks and societies of credit exceeds \$289,500,000. As the population has increased but little these figures show the general commercial prosperity of France, which is in fact one of the leading trading nations of the world. The total trade of France in 1898 was \$870,430,080 for imports, \$680,381,040 for exports.

Notwithstanding her position as a foremost mercantile nation of Europe, France has been much concerned in recent years over the conditions threatening her commercial and maritime trade. There has been a noticeable decline in exports, and a strong foreign competition in the manufacture and production of articles formerly considered as belonging wholly to the French trade. The Marseilles chamber of commerce, while reporting a gain for the year 1898 of 163,943 in the tonnage entering Marseilles, compares this gain with the year's increase at other European ports, such as Genoa, a Mediterranean port, showing an increase for the year of 516,000 tons; Antwerp, with an increase of 646,000 tons, and Rotterdam, with 731,000 tons increase. Of quite as much importance to France as the diversion of her trade into channels other than her own is the gradual decadence of the French merchant marine. This is a subject of considerable interest to America, whose own fleet of merchant vessels has declined so greatly from the days of its supremacy before the Civil War, and whose enormous trade is so largely carried in foreign bottoms. The disappearance of the French flag from commerce, though for a time gradual, has lately become very marked. In 1896, according to the French press, 203 French ships, with 303,600 tons burden, were in the foreign trade; in 1897 the number had fallen to 191 ships, with 300,000 tons. The figures were not published for 1898. More startling figures were given for the years 1898-99, in a speech made before the special parliamentary commission appointed to consider the decline of the French marine. In 1898, according to this discussion, which was published in the United States Consular Reports for March, 1899, France was at the head of the list of ships passing through the Suez Canal. In 1899 France was fourth, as follows: England, 2161 ships; Germany, 322; Italy, 230; France, 218; Holland, 200. Additional testimony showing the comparative vitality of various national merchant marines were the statistics of growth presented to the committee. Within the past ten years Great Britain has increased her fleet of merchant vessels 33 per cent.; Germany has increased her marine 107 per cent.; Spain, 30 per cent.; Italy, 68 per cent., and Holland, 57 per cent. In France there has been a loss of 1 per cent. It was stated before the commission that at the present time only 25 per cent. of the vessels entering and leaving the French ports carry the French flag. Various plans have been suggested to arrest and recover declining trade and revivify the merchant marine. The decadence of the latter is said to have come about in spite of the large subsidies granted by the act of 1893. The high cost and slow building of French ships is one cause assigned for the non-increase of the French merchant fleet. Others are the defects in the subsidy laws, and the high freight rates of French ships. Some have complained because the extensive protective tariffs of France do not apply to French ship-owners, who can order their ships in England and bring them into France without paying duties. Most of the French vessels also are sailing vessels. In September, 1898, the tonnage of French sailing vessels in process of construction was 25,600, against 2693 for England and Germany's 150. Yet French steamers built aggregated only 50,000 tons, against England's 1,360,000 and Germany's 144,000. Remedies suggested include: A flag tax on goods not brought in French ships, as a complement to the protective tariff on foreign goods of whatever class; limiting colonial trade to French ships; cheaper transportation to the sea, to offset the present low rates to the foreign ports of Amsterdam and Antwerp.

Commercial treaties have recently been concluded with Italy and Japan, and also with the United States. The last named treaty was signed on July 24, and was to reach the United States Senate early in 1900. It is the first reciprocity treaty affecting American trade with a large commercial nation. Among the benefits to be received by the United States are a reduction of tariff rates averaging 20 per cent. on a large number of articles, among which are petroleum and mineral oils, cotton, copper, rubber, machinery, etc. Several of these, as cotton, enter France practically duty free. Among the articles excluded from this list are a number of important agricultural products, whose exception was insisted on by the French agrarian interests. France, on her part, will receive by the treaty a reduction of from 5 per cent. to 20 per cent. on duties now levied on over 100 chief French products sent to this country. Champagne is not among these, as France was not willing to grant large reductions in return for the lowering of duties on such wines. The treaty has been much discussed in France, being brought forward in the *Revue du Commerce Extérieur*, in August, as "one of the economic events of the second half of the nineteenth cen-

tury, meaning no less than the entrance of American manufactures on the European market, the commencement of manufacturing competition between the new world and old Europe." The *Revue* speaks of the tariff arranged by the new treaty as a partial abandonment by the United States of what the *Revue* calls the autonomous tariff—that is, one independent of the commercial needs of other countries, and the introduction of the conventional tariff, after the European fashion. The American policy did not tend to a generalization of the conventional tariffs, however, Article 3 of the customs law of 1897 having been enacted almost exclusively for the purpose of negotiating a treaty with France. The *Revue* considers that the commercial treaty with France has broken the first link in the chain which protected European industry against American competition. "The United States," it says, "will now invade with giant steps the markets of the continent. Its only drawback will be ignorance of commercial customs—the employment of measures other than metric, the lack of knowledge of the languages, the absence of assortments of goods suited to special needs, and the aversion of American exporters to granting credits. These obstacles are evidently not insurmountable. When the Americans have mastered them, our manufacturers will be placed in a very trying position."

A formidable opposition sprang up in the United States in regard to the ratification of the French treaty. The fruit-growing interests objected to the reduction of the duties on French preserved fruits and olive oil, and nearly every class of trade affected by various French importations made some remonstrance. The principal question, however, seemed to be whether the country as a whole would be benefited by the new treaty, and if so to what extent the special trade should be considered.

Currency.—By a convention which is renewable from year to year the five contracting states of France, Belgium, Italy, Switzerland, and Greece have agreed to have their gold and silver coins, respectively, of the same fineness, weight, size, and current value, making them interchangeable at par. This monetary system has been adopted wholly or in part in several European countries, including Russia and Spain, and in many South American countries. The common gold coins of France are the 10 and 20 franc pieces, and the silver coins are the $\frac{1}{2}$, 1, 2, and 5 franc pieces and the 20-centime piece. The amount of currency in France was estimated in 1897 to be 6,375,000,000 francs, of which 5,260,000,000 francs were in French coin. These were made up by 3,675,000,000 francs gold coin, 1,380,000,000 francs in 5-franc silver pieces, and 205,000,000 in fractional silver coin. (For later estimate see MONEY.) The Bank of France has the monopoly of issuing bank-notes. Its capital is estimated at 182,500,000 francs.

Army.—In conformity with the practice of other European powers, all Frenchmen who are not declared unfit are liable to military service from the age of 20 to that of 45. According to the budget for 1899, the peace strength of the army in France was estimated at 616,092 officers and men. The French army proper was placed at 547,515; in Algeria, 55,122; in Tunis, 13,455. Required army service includes 3 years in the active army, 10 in the reserve of the active army, 6 in the territorial army, and 6 in the territorial reserve. The war footing of the French army, including its reserve and territorial forces, is estimated to be for 1899 about 4,160,000 trained men, to which 4,000,000 untrained might be added. The gradual increase of the French army, provided for by a law of March, 1897, is steadily going on. The increase will eventually enlarge the peace footing of the infantry by 50,000 men.

Navy.—The naval strength of France was in 1899 second to that of Great Britain. According to the classification of the 1899 publication of the United States Navy Department on naval progress abroad, the French fleet was reported in July, 1898, to consist of 27 battle-ships, and 8 building; 9 armored cruisers, and 10 building; 30 protected cruisers, and 10 building; 16 unprotected cruisers; 14 coast-defence ships; 13 torpedo vessels, and 2 building; 8 torpedo-boat destroyers in course of construction; 211 torpedo boats, and 38 building, and 1 ship for special purposes. Various programmes for increasing the fleet have been presented, but none have been fully carried out. Some little comment was caused about the beginning of 1899 by the declaration of M. Lockroy, former French minister of marine, that the French war fleet, though second in size among the navies of the world, was merely an ornament, principally for lack of bases of supply, owing to the neglect to secure and improve coaling stations. In 1899 there were laid down 13 large and 28 small vessels, including several submarine boats, with a tonnage of 131,054. The number being constructed during the year was 34 large and 72 small vessels, with a tonnage of 255,533. There were launched 2 battle-ships, 4 cruisers, and 2 gunboats; 2 torpedo-boat destroyers, 1 torpedo boat, and 2 submarine torpedo boats.

Colonies.—France administers the affairs of over a score of colonies, protectorates, and dependencies, with an aggregate area of 3,617,327 square miles and an estimated population of 52,643,000. These territories are as follows: Asia: French Indo-China, including Anam, Cambodia, Cochin China, and Tonquin; Africa: Algeria, French Congo and Gaboon, French Soudan, Senegal, Guinea, Dahomey, Madagascar, and

Tunis; America: French Guiana, Martinique, Guadeloupe and dependencies, St. Pierre, and Miquelon; Australasia and Oceania: New Caledonia and dependencies and the Society Islands. The total trade of these colonies in 1897 was \$78,600,980 for imports, \$85,686,358 for exports.

HISTORY, 1899.

The history of France in 1899 falls naturally under the three following heads: (1) The Dreyfus Affair, which in respect to the amount of comment that it occasioned overshadowed every other topic in the current history of France; (2) Internal Politics, so far as they were not inextricably bound up with the Dreyfus case, and (3) Foreign Affairs, including as their most important feature the conclusion of the convention with England in settlement of the conflicting claims to territory in the region of the Upper Nile.

I. THE DREYFUS AFFAIR.

Introductory Review.—A brief summary of the case down to the beginning of 1899 may be of service as an introduction to the record of the year. Captain Alfred Dreyfus, an officer in the French army, was convicted in the autumn of 1894 by a secret court-martial of having sold or given secret military information to a foreign power, presumably an enemy of France. Which foreign power it was did not appear, but suspicion at first turned to Germany and afterward to Russia. After a public degradation on January 4, 1895, he was imprisoned on the Ile du Diable, near the coast of French Guiana, whither he was transported March 10, 1895. For two years little was heard of the case, but in the autumn of 1897 there were rumors that attempts were being made to prove his innocence. In November, 1897, Mathieu Dreyfus observed the similarity between the handwriting in the chief document of the case, known as the *bordereau*, and that of Major Esterhazy. The latter officer was brought to trial in January, 1898, but was acquitted by the court-martial by a unanimous vote. A few days later appeared the famous "I accuse" letter of Emile Zola, who charged the general staff of the army with having conducted a partial inquiry and with suppressing proofs establishing the innocence of Dreyfus. While the main part of his letter dealt with the alleged rascality of the general staff in the matter of the Dreyfus case, the government took note only of the passages in the letter which accused the Esterhazy court-martial of having rendered an iniquitous verdict and knowingly acquitted a guilty man. M. Zola was brought to trial on account of this passage. In the meanwhile, the country was thrown into a state of great excitement. A small body of men set zealously to work to establish the innocence of Dreyfus, but the discussion of the matter brought out a more and more violent opposition, and this opposition identified itself with the anti-Semitic movement. Scenes of violence took place in the streets and in the chamber of deputies, and a spirit of disorder showed itself even in the court room when the trial of M. Zola began. In this trial few witnesses attended on behalf of the defence, while for the government the witnesses were chiefly officers of the army and members of the war office. It was the constant effort of the counsel for the defence to reopen the Dreyfus case, and this was as constantly opposed by the prosecution, who tried to confine all discussion to the question of the Esterhazy court-martial. The result was a verdict against Zola and of the publisher of the paper in which his letter appeared. Appeal was taken by the defence to the Court of Cassation on the ground that trial should have been brought not by the war office, but by members of the Esterhazy court-martial. This appeal was sustained, and the members of the Esterhazy court decided to push the case against M. Zola and the publisher. The second trial began on May 23, and the appeals of the defence having been dismissed, a decision against them was finally rendered. In the meanwhile, July 2, Zola left Paris. Soon afterward, on July 7, M. Cavaignac, minister of war, revived the excitement over the affair by a speech, in which he declared the reasons for his belief in the guilt of Dreyfus. His grounds were the alleged confession of the accused and the existence of three incriminating documents. The latter consisted of letters which were supposed to have passed between the Austrian military attaché in Paris, M. Panizzardi, and the German military attaché, Colonel Schwarzkoppen. No sooner had this speech been made and placarded throughout France than Colonel Picquart declared that two of the documents had nothing to do with the Dreyfus case and that the third bore all the marks of forgery. This third letter was the only one that expressly mentioned the name of Dreyfus. The next important event in the history of the affair was the confession of Colonel Henry that he had forged this third letter in the autumn of 1896. Henry was taken to prison and committed suicide by cutting his throat with a razor from his dressing-case. The alleged confession of Dreyfus appeared to rest upon flimsy evidence, so little was left of the grounds which M. Cavaignac had assigned for his belief in that officer's guilt. In the meanwhile, suspicion pointed more clearly to Esterhazy as the spy whose revela-

tions accounted for the systematic leakage of French military secrets. On September 9 Esterhazy left France, and was later reported to be hiding in London. The next important event was the arrest of Colonel Picquart late in November on charges of forgery and of revealing documents concerning the national defence. His case came up before the correctional tribunal, but was afterward transferred to military jurisdiction. In the meanwhile, the Dreyfusards had succeeded in inducing the cabinet to countenance a movement for revision. On September 26, after the revelations in the Henry affair had been made public, the cabinet decided that the demand for revision should be submitted to the Court of Cassation. The criminal chamber of this court decided on October 29 that there was ground for proceeding to a supplementary investigation, and on November 15 it notified Dreyfus that revision proceedings had begun. In the meanwhile, Colonel Picquart had applied for a decision upon the question whether a military or civil tribunal should have charge of his case, and on December 8 the court decided that the military prosecution should be suspended, and required that all the documents in the Picquart case should be submitted to it for examination. Public interest was now centred in the question whether the war department would submit to the court the secret documents in the case. On December 27 these documents, known as the secret *dossier*, were communicated to the court.

The Question of Revision.—On January 8, 1899, M. Quesnay de Beaupaire, president of the civil chamber of the Court of Cassation, resigned his office and began a campaign in the newspapers against the members of the court, accusing them of gross partiality for Dreyfus and of virtually conspiring to exonerate him. He demanded that the case should be transferred from the criminal chamber to the court as a whole. The minister of justice upheld the integrity of the court and the senate supported him in this view. The question of submitting the case to the whole court was taken up by M. Mazeau, the first president of the Court of Cassation, and while he absolved the members of the criminal chamber from any suspicion of unfairness, he recommended that so important a matter should be decided by the entire court. An appeal for the transfer of all cases of revision, including the Dreyfus case, to the whole court was voted by the chamber of deputies on February 10 and approved by the senate on March 1. This entailed some delay, but it was more than offset by the additional weight given to a decision rendered by the entire body. The criminal chamber of the court was required first to make an examination into the affair. On March 14 the Picquart case was transferred from the military to the civil court. The inquiry of the criminal chamber into the Dreyfus case brought out some most important testimony. By some means the *Figaro* secured access to the secret proceedings of the chamber, and the revelations which it published made a deep impression upon the public mind. There were evidences of a change of sentiment and of a general feeling that the accusations made by the general staff rested on a very slender foundation of documentary evidence. Many of the newspapers that had bitterly opposed revision now came out in its support, and revision seemed to be favorably regarded by the majority of the people.

Revision Ordered.—On May 28 it was announced that the reporter of the court, M. Ballot-Beaupré, had reported in favor of revision on the following grounds: Documents had been submitted to the judges in the court-martial of 1894 which the defence had not seen; there were contradictions in the testimony of handwriting experts as to the authorship of the *bordereau*; the paper upon which the *bordereau* was written was the same as that used by Esterhazy; there was no proof that Dreyfus had ever confessed his guilt; Henry's confession changed the aspect of the affair; the change of a date in the *bordereau* strengthened the suspicion of Esterhazy's guilt; official documents proved that there were no relations between Dreyfus and the foreign embassies; finally the reporter said there was only one question before the court, and that was the authorship of the *bordereau*, and he declared his belief that it was not written by Dreyfus, but by Esterhazy. On June 3 the Court of Cassation rendered its decision. It quashed the decision of the court-martial of 1894 and ordered a re-trial by a new court-martial at Rennes, which was to decide upon the following question: "Is Dreyfus guilty of having in 1894 instigated machinations or held dealings with a foreign power or one of its agents, in order to incite it to commit hostilities or undertake war against France by furnishing it with the notes or documents enumerated in the *bordereau*?" In the meanwhile, on June 1, Colonel Du Paty de Clam was arrested on charges that arose out of the testimony brought before the Court of Cassation during its investigation. Soon afterward Colonel Picquart was released and the charges against him were dismissed. After the decision of the court, the *Sfax*, a second-class cruiser at Martinique, was ordered to the Ile du Diable to carry Dreyfus back to France. Dreyfus embarked at Cayenne on June 10 and landed at Quiberon on July 1; thence he was taken to Rennes to await the trial. There was great fear in some quarters of popular outbreaks as soon as Dreyfus set foot in France, and extreme precautions

were taken to avert this, but there was a general spirit of acquiescence, and no serious demonstrations occurred.

The Rennes Court-Martial.—In the meanwhile important political events had taken place, which, though they will be described at greater length in succeeding paragraphs, may be summarized here. In the midst of the agitation over revision occurred the death of President Faure, February 16, and on February 18 the National Assembly met at Versailles to choose his successor. M. Loubet was elected on a single ballot. There was great fear of serious popular disturbances, and there were in fact riots on the streets. President Faure's funeral was the occasion of a demonstration on the part of the Nationalists, and M. Déroulède and another deputy were arrested. A more important event that took place before the meeting of the new court-martial was the fall of the Dupuy cabinet and the formation of the Waldeck-Rousseau ministry, with General de Galliffet as minister of war. De Galliffet removed Zurlinden from the office of military governor of Paris, and employed disciplinary measures against officers who had been too outspoken in their opinions on the Dreyfus case. The first session of the new court-martial was held in the hall of the Lycée, at Rennes, on August 7. The president of the court was M. Jouaust, and the associates were Lieutenant-Colonel Brougniart, Commandant Proffillet, Commandant Merle, Major de Bréon, Captain Parfait, and Captain Beauvais. Major Carrière, as commissary for the government, conducted the prosecution. After the preliminary examination of the prisoner the court went into secret session for several days to consider the *dossier* of the war office. Public sessions began on August 12. The first important event in the trial was the evidence of General Mercier, and a rebuttal of a portion of it by M. Casimir-Périer, the former president of the republic. Mercier declared that he still believed Dreyfus guilty, but his evidence was little more than a repetition of matters which were already known. In justification of the submission of secret documents to the court, he represented that there was grave danger of war between France and Germany. This was, however, discredited by Casimir-Périer. On August 14 occurred the cowardly attack on M. Labori, who was shot in the back while on his way to court. The assailants escaped, and the wound, though severe, was not fatal. On August 22 M. Labori had sufficiently recovered to resume his attendance at court. In the meanwhile a mass of testimony was given by members of the general staff and former members of the government, including Generals Billot, Zurlinden, Chanoine, Roget, de Boisdeffre and Gonse, Colonel Cuignet, and MM. Cavaignac, Hanotaux, and Lebon. The evidence of M. Bertulus and Colonel Picquart in favor of Dreyfus was widely quoted in all the Dreyfusard papers. The former accused the officers of the general staff of complicity with Esterhazy and implied the collusion of Esterhazy and Henry. Colonel Picquart said that the *bordereau* probably emanated from the department of Du Paty de Clam, who had been guilty of serious acts of imprudence in connection with the transmission and copying of confidential documents. The testimony of M. Bertillon, the hand-writing expert, consisted in so complicated an explanation of his "system" that it mystified the court and occasioned much ridicule among the public at large. The most exciting incident occurred, after M. Labori having recovered from his wound had returned to court, when members of the 1894 court-martial were placed on the stand. Colonel Maurel, who had presided over that court-martial, admitted that documents had been secretly communicated to himself and the other members of that court, but that he had examined only one of them. Captain Freystaetter, one of the judges of the 1894 court-martial, said that his belief in the guilt of Dreyfus was strengthened by these secret documents, and also testified that Colonel Maurel had made a commentary on each document as he passed it to the judges. Then followed an attempt to decide between the veracity of Maurel and Freystaetter. Captain Lebrun-Renaud declared that Dreyfus had said that if he had handed documents to Germany it was an exchange for more important ones. Dreyfus denied this, and Major Forzinetti, who was governor of the prison in which Dreyfus was confined, said that Dreyfus had always asserted his innocence. The defence complained that the witnesses for the prosecution always based their testimony on the words of persons who could not be summoned, that frequent reference was made to Sandherr and Henry, who were both dead, and that the testimony of Du Paty de Clam, who absented himself on the ground of ill-health, was not taken. A foreign witness, named Cernuschi, who was described as an Austro-Hungarian refugee, appeared before the prosecution on September 24, and caused a considerable sensation by declaring that Dreyfus had given important secrets to a foreign military officer. This gave M. Labori the opportunity to ask that the government should apply through the proper diplomatic channels to the power or powers whose representatives were concerned in this for the production of the documents named in the *bordereau*. On September 5 he telegraphed to Emperor William and King Humbert to allow their military attachés to give testimony at the trial. He requested the court to subpoena these witnesses. This was refused, and when the mili-

tary attachés announced that they could not come to Rennes, but would give their testimony before a commission, the court-martial refused to appoint the commission. Nevertheless to the people outside the court the following disclaimer on behalf of the German government carried conviction that Dreyfus had not been concerned in the dealings with Schwarzkoppen. This recited that the imperial government had never entered into any relations with Dreyfus, either directly or through its agents. Panizzardi had already published a similar disclaimer. The taking of evidence was completed on September 7. After speeches by Major Carrière for the prosecution and by M. Demange for the defence, and a final affirmation of innocence on the part of the prisoner, the court found the verdict of guilty by a vote of 5 to 2, but found extenuating circumstances, and condemned Dreyfus to ten years' imprisonment. An appeal from this decision was at once taken. The verdict was received with great delight by the anti-Dreyfusards, but there were no public disturbances, and, in spite of the dissatisfaction of the friends of Dreyfus, there was general acquiescence in the decision of the court. The members of the court-martial signed a recommendation to mercy on September 11, and on the 19th the council of ministers favored a pardon. The same course was recommended in a report by General de Gallifet, and President Loubet decreed a pardon on the 19th. On the following day Dreyfus left the prison at Rennes and went to his home at Carpentras, near Avignon. Upon his release he declared that while the republic had restored him his liberty, he should continue to seek for the restoration of his honor and to repair the judicial error of which he was still a victim.

Public Opinion of the Affair.—Outside France the verdict was received with indignation, and in several countries movements were started for the boycotting of the Paris Exposition of 1900. In England and the United States the comments on the chiefs of the French army, and the general attitude of the majority of Frenchmen, were especially severe. Nor could the miscarriage of justice be attributed solely to the influence of the mob alone. Frenchmen of the highest reputation for intelligence were vehement anti-Dreyfusards. M. Brunetière, one of the most learned, if not the most eminent, of French critics, called the Dreyfus affair the result of "the monstrous, abnormal, essentially morbid dilatation of self," and attributes the basest motives to the little group of men who championed the accused officer. In all foreign countries the prevailing opinion was that France had brought upon herself a lasting disgrace. The popular dislike of France did not, however, work its way out into official relations, which continued friendly, and gradually the talk of boycotting the exposition died out. There is no need of presenting here the grounds for the belief in the innocence of Dreyfus. These have been repeatedly shown in the press, and the above outline of the affair itself is sufficient to indicate them. But a brief summary of the anti-Dreyfusard view may be of service. The speeches of the friends of Dreyfus and the favorable testimony that was given to the court-martial have been quoted at great length, but the case of their opponents has not been presented with any degree of completeness. No doubt there is a good reason for this, apart from the natural sympathy of the foreign press correspondents with the Dreyfusard side, since the very premises of the anti-Dreyfusards seemed to show that the discovery of truth was not their object. In fact, the attitude of many of their most prominent spokesmen was such that all investigation of their side of the case seemed fruitless, since the inquirer was met at the start with the remarkable statement that even if a man knew the truth he ought not to declare it lest it should in some way undermine the foundations of society. It may be that this shifting of the question from the guilt or innocence of Dreyfus to the expediency of telling the truth robbed the anti-Dreyfusard arguments of their seriousness, and made it seem a waste of time to investigate them. If a body of men declare at the outset that a certain decision must be sustained, whether right or wrong, it is natural that it should seem useless to inquire into their arguments. Nevertheless, since many of the most prominent men in France, as well as the great majority of the people, were well pleased with the decision of the Rennes court-martial, it may be of interest to note some of their statements of view on that subject. The prevailing attitude was one of acquiescence in the decision of the court-martial. There was no evidence of any doubt as to the competence or sincerity of the members of the court. Great stress was laid upon the fact that the court had all the information before it which the friends of Dreyfus were able to supply, and that from the legal point of view their judgment was beyond criticism. The forms of justice, according to the French view of it, had been maintained in all respects, and the new evidence which had been developed since the original court-martial of 1894 was all laid before the court. As to the influence upon the members of the court of the generals who appeared before them and denounced Dreyfus in such vehement terms, the anti-Dreyfusards had little to say. They dwelt merely on the fact that the judges were honest men, of good reputation, and came to their decision in a full knowledge of all the facts. The extenuating circumstances which the

court found and which gave the Dreyfusards the chance to say that a doubt of the prisoner's guilt lingered in the minds of the judges was explained by the anti-Dreyfusards as the result merely of a desire to mitigate the rigors of the punishment. How could there be any extenuating circumstances, said the Dreyfusards, for an act of treason committed by a well-to-do and intelligent officer whose prospects were of the best? The verdict should have been either guilty or not guilty, and this qualified sentence indicated doubt in the minds of the judges. To this it was replied that the only way of softening the punishment was to find extenuating circumstances. It was a necessary compromise in view of the character of the law. There have been instances of a verdict of not guilty even when the judge was convinced of the prisoner's guilt on account of the failure of the law to adapt the punishment to the different degrees of guilt. A judge finding the punishment too severe and having no alternative but to pronounce the prisoner guilty or innocent might choose to render the latter sentence in order to spare the prisoner a suffering which was beyond his deserts. Speculating on this point, a French writer asks if the judges at Rennes might not perhaps have taken into consideration how little injury the revelation of the document mentioned in the *bordereau* really caused France. Again it was suggested that the finding of extenuating circumstances was merely a way of expressing the view that Dreyfus had already paid a part of the penalty by his confinement on the Ile du Diable. Since the law did not admit of imposing any heavier penalty than an imprisonment of ten years, it was natural that the court should seek to offset the undue harshness of the sentence in this case by finding extenuating circumstances.

As to the universal condemnation of France by foreign nations, it seemed to some French writers that such an attitude was wholly pharisaical. Each country seemed to thank heaven that it was not like the nation in which this iniquity had triumphed. "We are very far, indeed," says a French writer, "from despising the opinion of the rest of the world, but we do not give up our right of judging this opinion in each case and appraising its just value. It is perfectly true that no other country resembles us, if by that they mean to say that no other country would have tolerated the opening and prolongation of such a trial. It is in France alone, the nation of generous tradition, that this phenomenon has been possible, and that it has been permitted to endure so long." In general, the French retort was that in other countries a similar affair would have been hushed up at once, and therefore could not have excited such general comment. The condemnation of other nations was therefore taken in France as in reality a testimonial to the French nobility of character, to their generous desire to give a condemned man the benefit of the doubt. In no other country, it was said, would a condemned man have had such a chance for vindication. "When another country shall present the spectacle that we have presented, when it shall have sacrificed its repose for several years, when it shall have compromised its most serious interests in order to permit a condemned man to prove a hypothetical innocence, we shall accord to its lessons and its remonstrances the attention which so chivalrous a devotion to justice will have deserved. But where is that country? We look in all directions, but see it nowhere." Nevertheless, the attitude of the other countries toward the Dreyfus affair caused surprise and alarm in France. Some French writers went so far as to say that the consequences of the affair were likely to be more serious in the domain of foreign relations than in that of internal affairs. It was expected that the exposition of 1900 would have a pacifying effect upon all the factions in French politics. On the other hand, the almost universal condemnation of France on the part of foreign countries was regarded very seriously. To Frenchmen, it seemed as if the entire world were prejudiced against them, and there were some who blamed the Dreyfusards and the anti-Dreyfusards alike for the existence of that prejudice. It was said, too, that the foreigner had no business to occupy himself with an affair which did not concern him, and that this tendency to form an unfavorable opinion on the subject was proof of hostility toward France. To this view of the matter a more moderate writer replied that it was natural that foreign nations should be interested in what occurred in France, which, as some said, had been "for so long a time the centre of the civilized world." And as to any benevolence on the part of any foreign nation, this view was dismissed as absurd. It was pointed out that the Dreyfus affair had greatly surpassed in interest all other *causes célèbres*, and might well rouse interest quite apart from any feeling of hostility toward France. That this interest in the case had resulted in a general unfavorable view of the conduct of the French people could not be denied. Russia, the ally of France, had shown it no less than Germany and England. Catholic countries like Spain and the South American republics, neutral countries like Catholic Belgium and Protestant Switzerland, all had given evidence of the same opinion on the affair. Even among the Moslem and anti-Semite population of the Nile Valley the Dreyfusards were numerous, and a Moslem journal of Egypt had declared in favor of the cause of Dreyfus. In these

facts the moderate publicists could see no evidence of an unreasoning hostility to France, and they accounted for them as resulting from a lack of information on the subject. "Under these conditions," says a French writer, "why should we be astonished that a cry of amazement and disgust should be raised against us everywhere at the news that the Rennes court-martial had condemned Dreyfus? They have seen in this verdict a deliberate act of injustice; they have devoted the court-martial itself to infamy, and, what is more serious and at the same time supremely unjust, they have identified all France with this court-martial and have covered it with obloquy. This is the terrible situation, a situation the more lamentable that, admitting the anti-Dreyfusard theory that the opinion of foreigners has been created by artificial means, this opinion is none the less sincere. Affairs having come to this point it was inevitable that this situation should be made use of by our real enemies in order to poison the mind of the world against us and raise difficulties in our path. A certain portion of the press, with the *Times* at its head, has not failed to do this and has started a veritable campaign to boycott not only the exposition of 1900, but all France and everything that is French. These efforts have not produced the immediate result that was expected, since the exposition will not be boycotted, but this is only a detail. The serious fact remains that unfavorable opinion toward us has increased, so all our efforts must be put forth in the first place to render this opinion more favorable to us, and, in the second place, to avoid everything in future that can discredit us anew. Let the Dreyfusards and the anti-Dreyfusards set themselves to work and in a noble spirit of rivalry repair the evil which each faction accuses the other of having committed."

II. INTERNAL POLITICS.

The Presidency.—The death of President Faure (*q. v.*) occurred on February 16, and in accordance with the constitutional requirement for the immediate filling of the vacancy there was a joint session of senate and chamber as a National Assembly at Versailles on February 18. M. Loubet (*q. v.*), the unanimous choice of the Republican groups in the senate, was chosen by the assembly on a single ballot by 483 votes as against 279 cast for M. Méline and 54 divided among Cavaignac, Deschanel, Dupuy, and others. The message of the new president was read in parliament on February 22. It defined the objects of his policy as tolerance and harmony, and declared the necessity of showing equal respect to each of the elements in the state—to the chamber, the magistracy, and the national army. The president further asserted his intention to suffer no diminution of his constitutional rights in the execution of his duties. The choice of M. Loubet was taken as a sign of a more compromising spirit toward the Dreyfus affair. M. Méline's devotion to the interests of the army and his determined opposition to revision did not suffice to carry his election.

Nationalist Agitation.—M. Déroulède (*q. v.*), the president of the League of Patriots, together with other Nationalists and anti-Dreyfusards, stirred up a tumult on the streets after the session of the National Assembly with the absurd idea of preparing the way for a *coup d'état*. Nothing came of this, and the rioters made another attempt on the occasion of President Faure's funeral, February 23. When the troops were returning from the ceremonies M. Déroulède, who was accompanied by the national deputy Marcel-Habert and other members of the League of Patriots, seized the bridle of General Roget's horse and summoned him to lead his troops to the Elysées. The only result of this was the arrest of some four hundred agitators, Déroulède and Marcel-Habert among them, and their prosecution as disturbers of the peace. M. Déroulède declared that his purpose was to replace the parliamentary by the plebiscitary republic. The headquarters of the League of Patriots and other leagues that had shown hostility toward the government were searched and papers were said to have been found that would serve as a basis for a prosecution of Nationalist and Royalist conspirators. The government, however, apparently thinking it unwise to take the affair too seriously, did not show much activity in the matter. Déroulède and Marcel-Habert were brought to trial on May 31 and both acquitted. Efforts to repress the anti-Semitic agitation had already been made. M. Max Régis, the notorious anti-Semite, who had been elected mayor of Algiers, was removed from office on January 9, and on April 15 was condemned to four months' imprisonment for libelling the governor.

The Return of Marchand.—Major Marchand landed at Toulon on May 30, and on June 1 made his entry into Paris, where he was received with the greatest enthusiasm. This was a tribute to the man's personal heroism rather than to the political value of his achievements. Many Frenchmen, in fact, felt that the Fashoda affair was most discreditable. The very day on which Marchand landed at Toulon the senate accepted the convention which regulated the question of the Upper Nile, and in so doing definitely abandoned what had been the chief object of the Marchand expedition. The occasion brought forth a debate, in the course of which the govern-

ment was sharply criticised for its diplomatic policy during the Fashoda crisis. M. Delcassé said in reply that the government had accomplished all that could have been expected in the circumstances and had gained some real advantages. The only legitimate objection to the convention was that the commercial clauses favored English commerce at the expense of the French. This was the invariable effect of reciprocity, since when the French had conquered and organized colonies it was their English rivals who commonly developed their trade. This, however, was not the fault of the government, but of the commercial classes of France, who lacked the enterprise shown by the corresponding classes in England. In spite of the enthusiasm over Marchand, French writers continued to regard the Fashoda policy as an unpardonable mistake. It seemed to them an unnecessary humiliation, and that no government in the circumstances should have made the attempt.

Ministerial Crisis.—The decision of the Court of Cassation in favor of revision was generally received with approval, but among certain excitable Royalist and Nationalist groups there was much resentment over what was said to be an attack upon the honor of the army. This led to a disgraceful riot at the Auteuil race-course on June 4, when the members of certain Royalist clubs, who were said to have been instigated by the League of Patriots, made a rush for the reviewing stand, where the president was seated, and amid a great uproar attempted a personal assault. One of them struck the president's hat with his cane. He was arrested along with others who were concerned in the outrage, and a number of the clubs were closed. During the next week there was much apprehension lest a similar or even worse riot should break out on the occasion of the *Grand Prix de Paris*, to occur on June 11. This is one of the most important social events of the year, and it is customary for the president of the republic to attend in person. Precautions were taken for putting down any disorder, but the day passed without any serious disturbances. In one of the cafés, however, there was some disorder, and the police were said to have used violence in putting it down. On the following day one of the deputies interpellated the government "upon the violence of the police against the Republicans." The ministry defended the police from the charge, holding that they had done no more than their duty at a critical time. A sharp discussion followed, and finally the government submitted the question of confidence. It was defeated by a vote of 253 to 246, and the other motion before the chamber was passed to the effect that the chamber was resolved to support no government that was not determined to defend with energy republican institutions and to assure public safety. Thereupon the ministry resigned. M. Poincaré having failed to form a ministry, M. Waldeck-Rousseau was designated, and on June 23 the new ministry was announced. It consisted of M. Waldeck-Rousseau, president of the council and minister of the interior; M. Delcassé, who still retained the portfolio of foreign affairs; M. Decrais, the colonies; M. Millerand, commerce; M. de Lanessan, marine; M. Baudin, public works; M. Leygues, public instruction; M. Monis, justice; M. Caillaux, finance; M. Dupuy, agriculture, and General de Galliffet, war. The cabinet represented a great diversity of views. M. Millerand was the chief of the Socialist party in the chamber of deputies, and M. Baudin was also a Socialist. General de Galliffet, on the other hand, was the officer who exercised such severity in suppressing the Commune. The others represented varying shades of political opinion. The composition of the cabinet seemed to indicate the triumph of the revisionists and a general desire to see that justice was done in the Dreyfus affair. For an account of the comments which the presence of MM. Millerand and Baudin, the Socialist leaders, occasioned see the article SOCIALISM. On June 26 the ministry declared that the object of its policy was to put an end to the agitation against the republic, to demand faithful service from all departments of the administration, and to fulfil its duties with courage.

Nationalist and Royalist Plots.—M. Déroulède and Marcel-Habert continued their agitation after their release. Evidences were found of the existence of a plot against the republic, and the government's investigation implicated many of the Royalist and Imperialist groups, as well as the League of Patriots and the Anti-Semite League. MM. Déroulède and Marcel-Habert were arrested among others. On September 18 the senate assembled as a High Court to try the conspirators. Reference was made in the indictment to a widespread Royalist plot, in which the Duke of Orleans was concerned, and whose aim was by means of street riots to subvert the existing government. In connection with this agitation occurred the remarkable Guérin incident at the Rue Chabrol. M. Guérin, president of the Anti-Semite League, with several companions, fortified themselves at the headquarters of the league in the Rue Chabrol, and there for several weeks they defied the government, though, to be sure, no serious attempt was made to capture them. The police and the military blockaded the street to prevent their escape, and the siege, as it was called, lasted a month before the occupants of the house surrendered. The only affair connected with this incident that seemed at all serious was the attack upon

a number of churches by a mob of Anarchists and Socialists. The plundering of the Church of St. Joseph led to some fighting and the injury of a large number of persons. It was followed by many arrests. Toward the close of the year the conspiracy trials were going on in the senate in its capacity of High Court. On November 18 M. Déroulède was condemned to three months' imprisonment on the charge of insulting the president of the republic. On December 20, having again attacked the president and senators in the course of a violent harangue, he was condemned to two years' imprisonment. Out of the large number of persons arrested very few were convicted. Finally there remained only six accused. The High Court condemned four of these, urging, however, extenuating circumstances. M. Déroulède and two others were condemned to ten years' banishment, and M. Guérin to ten years' detention.

III. FOREIGN AFFAIRS.

Commercial Convention with Italy.—At the close of the year 1898 the French chamber voted by a large majority a commercial convention with Italy. It was taken as a sign of a desire on the part of both nations to maintain friendly relations in commercial affairs. The Italian chamber of deputies also voted the measure by a large majority on the 28th of January. A closer political *rapprochement* was expected to result from this commercial agreement.

France and England—Madagascar Question.—On January 6 the British government issued a blue book containing the diplomatic correspondence between England and France on the subject of the administration of Madagascar. By the treaty of 1865, which was confirmed in 1890, France granted certain privileges in return for England's recognition of the French protectorate over the island. The following were the chief grievances of which Great Britain complained: (1) France had violated her engagement in the convention of 1890 by imposing high duties upon English goods. The convention of 1890 had declared that the French protectorate of Madagascar would not injure the rights and privileges of the English subjects, one of these privileges being that the duty on English merchandise should not exceed 10 per cent. *ad valorem*. The duties levied by France were said to be much higher than this. (2) The government of Madagascar had further injured English commerce by preventing the natives, through intimidation, from purchasing English goods. (3) France had imposed restrictions on the commerce of Indian subjects in Madagascar. (4) Grave injury had been done to English interests by a colonial decree in 1898, forbidding the coasting trade, except in French bottoms, after January 1, 1899. The last-named grievance was recognized by the French government as real, and the decree was rescinded very promptly upon the demand of the British government. The tone of the comment in the British press was taken in France as indicating a desire to force a quarrel, but a more friendly spirit was soon evinced on both sides of the channel. The French government showed a readiness to redress the other grievances if they proved to be real. The affair aroused much ill-considered criticism in the press of the two countries. In England reference was made to the French policy of "pin pricks." In France, England was accused of exclusiveness in her own colonial policy, and some French writers argued that the only reason why Great Britain was not oftener attacked on this ground was that she followed a more shifty policy, her persecution of the foreign trader being carried on by clandestine or indirect means.

Muscat Affair.—This incident, though unimportant in itself, was the temporary cause of friction between France and Great Britain. The French government had obtained from the Sultan of Oman, whose territories lie at the southeastern extremity of Arabia, the lease of a port near Muscat. The British government of India, in order to neutralize the French advantage and prevent this port from becoming a French naval station, sent a squadron there and forced the Sultan, under the threat of a bombardment of the capital, to annul the French cession. By a treaty concluded in 1862 the French and English had engaged to respect the integrity of the Sultan's territories, and by an agreement between the Sultan and the British government of India in 1891 the former, in return for an annual subsidy, had promised that he would not alienate any of his territories. In the British Parliament it was argued that both the Sultan and the French government had broken their pledges. According to the French official version, however, the controversy was due to a misunderstanding. All that the French had obtained from the Sultan was the use of the port as a coaling station, and the two powers were practically on an equal footing. Either the French agent at Muscat had exceeded his instructions in asking for more than a coaling station or else the English agent had been misled as to the advantages which France had obtained. On March 6, 1899, M. Delcassé said in the chamber of deputies that France had asked only for a coaling station. The resort of the British government of India to a display of force in threatening the Sultan with a bombardment caused offence in France, but M. Delcassé afterward announced that the British

government had disavowed the action of the Indian viceroy and had expressed its regret. This was held to be sufficient in France, and the incident was regarded as closed. But for some time the comment in the French press showed a touch of mortification that England should have scored a point against France, and some complained that the French government was giving Great Britain too many chances for easy diplomatic victories. This irritation was aggravated later by the failure of the French government to carry out its policy in Shanghai, where since 1853 France had possessed a strip of land lying near the city. The French wished to extend their narrow limits, but the British, some of whom claimed property rights which such an extension would disregard, opposed this policy and prevented it from being carried out.

The Upper Nile.—The settlement of the Fashoda difficulty by the withdrawal of France from her claim to Fashoda left the question of the Upper Nile to be adjusted. This involved the delimitation of the French Congo and of the Bahr-el-Ghazal, a dependency of the Soudan. The desire of France was to obtain an outlet on the Nile, or at least to secure an open way for her commerce on that river. Nothing definite was stated upon the meeting of the British Parliament, but the hope was expressed that arrangements would be made to insure peaceful settlement of these questions by the two countries. A French writer gives the following résumé of the question: The influence of Egypt did not begin to make itself felt in the Upper Nile until after 1841. At that time, an Egyptian expedition ascended the Nile nearly as far as the 5th parallel, and the entire region was opened to European and native commerce. It was not until 1889, however, that the Khedive, Ismail Pasha, had annexed the Upper Nile region to Egypt. Samuel Baker, to whom this commission was entrusted, established three posts on the Upper Nile, but the real organizer of Egyptian control over these vast territories was Gordon, who succeeded Baker in 1874 with the title of governor-general of the Egyptian Equatorial Provinces. He established posts throughout the country as far as the frontier of Uganda, and all along the course of the Nile, and of the Sobat and other affluents from the east and also in the Bahr-el-Ghazal. His successor, Emin Pasha, later added other posts to those established by Gordon, both on the eastern and western sides of the Nile, and in 1881 fixed the limits of the Equatorial Provinces. Egypt not only extended its authority over the countries in the neighborhood of the White Nile, but over those traversed by the most westerly affluents of the Bahr-el-Ghazal and the Darfur. An Egyptian trader, named Ziber, secured great influence in the Bahr-el-Ghazal, and finally became its ruler under the authority of the Egyptian government. Thus a new province of Bahr-el-Ghazal was established next to Equatoria, with its capital at Dem-Ziber. Ziber was succeeded by Lupton Bey, who was governor of both Darfur and Bahr-el-Ghazal, and later brought under his authority all the country as far as the valley of the Nile, and he extended his sway even into the basin of the Chinko, an affluent of the Ubangi. The question to be answered in 1899 was how far the Egyptian sphere of influence extended in the direction of the Bahr-el-Ghazal before the Mahdist insurrection. This control was not only exercised over the entire left bank of the Nile, but over the upper basin of the Wella, the Mbomu and the Chinko—that is to say, over the southern part of the Congo Basin. As a matter of fact, Egyptian influence extended as far as the 4th parallel in the region of the Upper Congo. The decision of the convention of Berlin recognized as the southern limit of the Egyptian possessions the 4th parallel, making the Belgian Congo and French Congo contiguous to the Egyptian Soudan.

Anglo-French Convention.—The long-continued conflict between Great Britain and France over the limits of their respective claims in the region of the Upper Nile came to an end with the conclusion of an agreement on March 21, 1899. This agreement dealt not only with the question of the Upper Nile, but with the mutual boundaries of the French and English possessions in West Africa. It will be remembered that by the convention of June 14, 1898, the boundary separating Nigeria from the French Sahara was definitely laid down, while that defining the basin of the Tchad, especially in the east, in the direction of the Nile, was left unsettled. The text of the convention of March 21 is as follows:

"The undersigned, duly authorized for this purpose by their governments, have signed the following declaration:

"Article IV. Convention of June 14, 1898, is completed by the following propositions, which shall be considered as forming an integral part of it:

"(1) The government of the French Republic engages not to acquire either territory or political influence to the east of the line of the frontier defined in the paragraph following, and the government of her Britannic Majesty engages not to acquire either territory or political influence to the west of this same line.

"(2) The line of the frontier shall start from the point where the boundary between the Congo Free State and the French territory meets the line passing be-

tween the watershed of the Nile and the watershed of the Congo and its affluents. It shall follow in principle this line of water-parting up to its intersection with the 11th parallel of north latitude. From this point it shall be traced as far as the 15th parallel in such manner as to separate in principle the kingdom of Wadai from what constituted the province of Darfur in 1882; but which shall in no case be drawn so as to pass westward of the 21° of longitude east of Greenwich (18° 40' east of Paris), or to the eastward of the 23° of longitude east of Greenwich (20° 40' east of Paris).

"(3) It is understood in principle that to the north of the 15th parallel the French zone shall be limited to the northeast, and to the east by a line which shall start from the point of intersection of the Tropic of Cancer, with the 16° of longitude east of Greenwich (13° 40' east of Paris), shall descend in a southeastern direction until it meets the 24° of longitude east of Greenwich (21° 40' east of Paris), and shall then follow the 24° until it meets to the north of the 15th parallel of latitude the frontier of Darfur as it shall finally be fixed.

"(4) The two governments engage to appoint commissioners who shall be charged with the laying down of a frontier line conforming to the indications given in the second paragraph of the present declaration. The result of their work shall be submitted to the approval of their respective governments.

"It is agreed that the provisions of Article IX. of the convention of June 14, 1898, shall apply equally to the territories lying to the south of latitude 14° 20' north, and to the north of the 5° of north latitude between 14° 20' longitude east of Greenwich (12° east of Paris) and the course of the Upper Nile."

Despite the efforts of a portion of the French press to see in this convention a triumph for French diplomacy, it was acknowledged by well-informed French writers that their government had met with a check in its Fashoda policy. At the same time the adjustment in West Africa was regarded as favorable to France. The general line of demarcation described in paragraphs 2 and 3 separates the basin of the Nile from that of the Congo and the Tchad and defines the boundaries of the desert regions belonging to the two powers. It places the Libyan desert within the British domain. It leaves France in possession of the basin of Lake Tchad and Great Britain in possession of the valley of the Upper Nile as far as the 15th parallel. The agreement was taken by some as barring France in future from disputing British domination in Egypt, but this view encountered the objection that the line of demarcation, to the east of which France agreed not to acquire territory or political influence, extended north only so far as the southern boundary of Tripoli and did not affect Egypt at all. It was further said that if the Egyptian question came up in a practical form and the Khedive asserted his right to the Soudan, France would in no wise be prevented by these engagements from supporting his claims, since she would not be trying to extend her influence over Soudanese territory, but merely aiding another power in maintaining its rights. This view of the matter is important only as showing the efforts of the French press to find consolation for what was considered a diplomatic misfortune. The commercial clause is important. It extends the principle of equal treatment to the trade of each nation in the region lying between the Tchad and the Upper Nile. The French government, in notifying the public of the March convention, said that it had attained the object for which Marchand's Fashoda expedition had been undertaken—namely, to supply the French possessions on the Upper Ubangi with an outlet on the Nile. Another point in which the French found some satisfaction with this agreement was the alleged value of the territories attributed to the respective powers. It was said that the Bahr-el-Ghazal, which France had desired, but which England had gained, was of doubtful value, being infertile, marshy, and unhealthful—facts that had been sufficiently established by the Marchand expedition; that Darfur, which also was included in the English sphere, was hardly more valuable, and had furthermore been devastated by civil wars for several years. On the other hand the territories recognized as French were valuable acquisitions, especially Kanem, Wadai, and Baghirmi, and the French portion of the desert region comprised several valuable oases. Nevertheless the settlement was received with some chagrin in France. It was recognized that material interests had not been sacrificed, but political prestige was thought to have suffered greatly. It was said that the French government had receded from its position in the matter of Fashoda in the face of a threat of war, and it was blamed for the inconsiderate policy that had led it into a situation from which it could not escape without humiliation. In withdrawing from Fashoda the government had admitted a diplomatic defeat, but the convention of March had practically gained for France all that she could expect in the circumstances. This agreement was the more readily reached that it concerned itself only with the definition of the boundary on the Upper Nile and did not touch on the questions of Madagascar or Muscat (discussed above), or on that of the French shore, an account of which will be found in the article NEWFOUNDLAND.

Relations with Germany and Russia.—The exchange of courtesies between France

and Germany in July and between France and Russia in August occasioned much comment in the press as indicating a possible change in the general European situation. The German Emperor, William II., having entered the port of Bergen, Norway, paid a visit on July 6, 1899, to the officers of a French school-ship, whom he afterward invited on board his yacht. The Emperor sought to give the occasion the character of a friendly Franco-German meeting, and sent a cordial telegraphic message to the president of the French Republic. A similar exchange of courtesies followed at Geestmünde, where the officers of a French despatch-boat fraternized with officers of the German marine. There was much talk of a Franco-German *rapprochement* as a result of these meetings. Some held that these incidents marked the renunciation of the long-standing French ambition in regard to Alsace-Lorraine; others saw in them a menace to the Franco-Russian alliance, and still others regarded them as a sign of a European coalition to check the aggressive colonial policy of Great Britain. A good deal was said about the avenging of Fashoda, the liberation of Egypt, the transfer of South Africa to Germany and of India to Russia. But these international courtesies did not necessarily involve any general change of policy. They indicated rather an intention so far as possible to promote international peace. On August 4 the French minister of foreign affairs, M. Delcassé, paid a visit to St. Petersburg, where he was received with every mark of consideration by the Czar. Much the same sort of comment followed in the European press, especially in England, where the fear of a joint action on the part of France and Russia against that country was repeatedly expressed. A good deal was made of the return visit paid by Count Muravieff to France, which coincided with a number of very important events in international politics, of which the most recent was the war between England and the Transvaal. The situation was described in a semi-official note, which was communicated to the Russian press in the following form: "Although the sojourn at Paris of Count Muravieff did not have an official character, the Russian minister has had long and frequent interviews with the chief of the state and the French minister of foreign affairs—interviews which have permitted the representatives of both these friendly and allied nations to exchange ideas upon actual events. The friendship and intimacy now established between Count Muravieff and M. Delcassé will increase and will facilitate joint action in the interest of both countries."

No such aggressive motive, however, seemed to be at the basis of these visits, which were merely a sign that the Franco-Russian alliance, already known to exist, was still in force. The visit of M. Delcassé was plausibly interpreted by some as an assurance to Russia that the recent amenities which had passed between Germany and France had not altered the attitude of the latter country toward the northern power. It could not properly be construed as a menace to European peace. Perhaps the strongest guarantee of peace is the commercial interests of the great powers. It has been estimated that of the total produce and manufactures exported by the five great European powers England purchases about 28 per cent., and that England and her colonies alone buy each year from Germany almost as much as the other four great powers put together. It is further estimated that France sells more than twice as much to the United Kingdom as she sells to the other great powers, and that Great Britain buys more from the dual alliance and triple alliance than these alliances purchase from each other. From these and similar considerations it is urged that no advantage to be gained by the partition of the British colonies could begin to make up for the loss of wealth through the destruction of the British market. The main interest of the powers being more and more industrial as the years pass, the hope has been expressed that war will be avoided by every possible means and that an aggressive policy on the part of the powers toward Great Britain and her colonies is improbable.

Effects of French Foreign Policy.—In the latter part of November M. Delcassé reviewed in the chamber of deputies the course of the government during the year in its dealing with foreign affairs. His speech affords a good summary of the course of the French foreign policy. In the first place, in respect to China, there had been a serious difficulty in defining the boundaries of the French cession on the Bay of Quang-Tcheou-Wan on the Gulf of Tonquin. The French and Chinese commissioners could not agree, the surrounding country was thrown into a state of disorder, and two French officers were assassinated. Thereupon the French government immediately demanded satisfaction, and especially the punishment of the guilty parties. The Chinese government, finding itself in a difficult position, promised that there should be no more obstacles to the delimitation of the French territory. In M. Delcassé's review of these events he claimed that France compared favorably with other powers in respect to her influence in the East. Not only had she gained important concessions, but her moral position was strengthened by her protectorate over the Catholics. Another advantage to her was the protection of her Indo-Chinese boundaries by the promise of the Chinese government that it would not alienate any portion of its southern provinces to a foreign power. The Chinese policy of the French government was in favor of the "open door," and thus in ac-

cord with that of England and the United States. As to Africa, M. Delcassé declared that the Anglo-French convention had strengthened the French empire in Africa by giving it unity, and he held that the proper object of French policy henceforth was to strengthen their colonies within their existing borders and not to reach out for more territory. He cited as other advantages of the French policy the establishment of commercial harmony between France and the United States; the strengthening of the Franco-Russian alliance, as illustrated by the mutual visits of the French and Russian ministers, and the honorable part which France had played in The Hague conference. The attitude of the minister of foreign affairs toward the war between England and the Transvaal was the chief matter of debate during the discussion on the budget of the ministry of foreign affairs. A large part of the French press favored a distinctly hostile policy toward England. They took the position that France had been humiliated as a result of the recent foreign policy of the government and that her interests were neglected by the ministry. They favored a general coalition against England. While an adoption of this course would no doubt have been popular and to some extent removed the painful impression left by the Fashoda incident, M. Delcassé refused to allow the policy of the government to be swayed by the prevailing Anglophobia, and distinctly opposed any policy of interference with the South African conflict.

The Embassy at the Vatican.—An important subject that came up during the discussion of the budget of foreign affairs was the question of maintaining an embassy at the Vatican. The commission of the budget had suppressed that embassy on the ground of expense, and it had also cut down certain appropriations that had been made for foreign missions. M. Delcassé insisted upon the necessity of maintaining the embassy at the Vatican, and used his influence for restoring the former appropriations to the missions. In these measures he had the support of the left and the extreme left, but was opposed by the right and the Nationalists. He was finally successful. The opposition held that the French embassy to the Vatican was useless and that it should be abolished from economic considerations which alone should determine the policy of states. It was urged, too, that the Vatican was hostile to the government. On the other hand, it was said that the representation of France at the Vatican was all the more valuable if the relations were not cordial, since its presence there tended to maintain harmony at home and to placate the clerical interest. The appropriations for the missions were defended on the ground that the missionaries, wholly apart from their religious work, had rendered great services of an economic and commercial character to French interests in the East.

Colonial Policy.—There were signs in 1899, especially toward the close of the year, that the French colonial policy was varying toward commercial and economic development of the colonies already possessed instead of an aggressive attitude in respect to the acquisition of new lands. Members of the government emphasized the necessity of developing the French colonies, and deprecated the spirit of certain patriots, who, by referring to the alleged humiliation of France in the Fashoda affair, were always urging the government to gain more territory and to take an active part in the rivalry of colonial acquisitions. The war in South Africa drew the public attention sharply to the need of submarine cables under French control. It was pointed out that the telegraphic communications between France and her colonies, with the exception of Algeria and Tunis, were in the hands of foreign countries. It was even said that the important colonies of Indo-China and Madagascar might be attacked by a foreign foe and be occupied by the military force for fifteen or twenty days without any knowledge of the fact reaching the French government. The need of improving French submarine telegraphic communication had been appreciated for many years past, but was brought to public notice in an urgent manner by the events in South Africa, which illustrated the effective control on the part of England over the submarine cables of the African continent. The fact that news from the seat of war came exclusively over lines in the hands of the British authorities demonstrated the importance of this matter in a very striking manner. Among the submarine cables proposed in France were first a line to connect France with the Senegal; second, a network of lines in the Indian Ocean establishing an independent line with Europe and with Madagascar and other dependencies; third, a system in the Far East between Cochinchina and Tonquin. Other less important proposals were for French lines on the coast of western Africa to joint the French possessions of the coast with the Senegal; a line connecting Indo-China with Djibouti, and joining the network in the Indian Ocean which touched Madagascar; and finally a number of projects for lines in the Pacific. See FRENCH SOUDAN.

FRANKLAND, Sir EDWARD, foreign secretary of the British Royal Society, died August 13, 1899. He was born near Lancaster, January 18, 1825; was educated at the Royal School of Mines, London, and at Marburg, Giessen, and other German universities. During this time he came under the instruction of Playfair, Bunsen, and Liebig. His thesis submitted upon taking his degree at Marburg in 1849 stated his discovery of a method of isolating ethyl, the essential radical of alcohol and ether. He returned to England, and was professor of chemistry at Owen's College, Man-

chester, from 1851 to 1857. From the latter year to 1863 he was a lecturer at St. Bartholomew's Hospital, London, and for the next four years at the Royal Institution. He also lectured at the Royal School of Mines from 1865 to 1885. He served from 1868 to 1874 on a commission appointed to investigate the pollution of rivers and the domestic water-supply. Upon this subject he submitted exhaustive reports by reason of which the London water-supply was greatly improved. In 1871-72 he was president of the Chemical Society. Sir Edward had received the degrees of Ph.D., D.C.L., LL.D., and M.D., and in 1897 he was created a K.C.B. Among his publications are: *Lecture Notes for Chemical Students*; *Water Analysis*; *Experimental Researches in Pure, Applied, and Physical Chemistry*; *How to Teach Chemistry*.

FRATERNAL ORGANIZATIONS. According to the latest available statistics (December 31, 1898), there were in this country nearly 2,600,000 members of fraternal orders, and \$3,400,000 worth of benefit certificates in force issued by such orders. The germ of American insurance brotherhoods was in the transplanted English friendly societies, of which the Independent Order of Odd Fellows (introduced into the United States eighty years ago), the Ancient Order of Foresters (thirty-five years ago), and the United Ancient Order of Druids (sixty-five years ago), are the most important. In 1868 John Gordon Upchurch, a Freemason, founded at Meadville, Penn., the Ancient Order of United Workmen, a secret beneficiary society, designed to pay stipulated sums to the surviving relatives of members at the deaths of the latter by means of assessments paid by surviving members. This organization remains to-day practically the parent of all similar secret societies, of which there are perhaps 200, conducted on what is called the "lodge system," whose rise and development have taken place within the last thirty years, and more than one-half of which may be characterized as fairly successful.

The system of assessment assurance originally adopted was naturally crude, among other things including the payment of \$2000 insurance at the death of a member by means of a uniform assessment of \$1 per capita. Experience soon made plain, however, the necessity for a system of assessments which should take cognizance of increasing age of members; hence, the step-rate system of assessment was instituted, in which the rate, instead of remaining uniform during the life of a member, increases gradually by periods of years. The next step, in which 76 out of 87 of the more important of these organizations joined, was a system by which assessments are graded according to age at joining, and it is pointed out as significant that two of the more prominent societies have gone still farther and are making assessments which increase annually, according to the age of the member, in this way accumulating sums due surviving relatives of deceased members. As a general rule, the best types among the fraternal orders confine themselves to paying death benefits, although there are many which furnish partial, total, or permanent disability benefits, in some instances a funeral, a burial plot, and a monument benefit; benefits designed to cover accidents, and which will apply only in extreme old age; a medical attendance benefit, and, in the case of secret labor organizations which have mutual beneficiary features, a strike benefit, collected and distributed, of course, practically as similar funds are handled by straight-out trades unions.

The subjoined list includes the more prominent fraternal organizations, with the more important statistics and name and address of the secretary, so far as obtainable.

NAME OF ORGANIZATION.	Date of Foundation.	Membership.	Benefits Disbursed since Organization.
American Legion of Honor.....	1878	17,005	\$30,968,341
Ben Hur, Tribe of.....	1894	24,059	263,925
B'nai B'rith, Independent Order of.....	1843	32,780	41,263,000
Brith Abraham, Order of.....	1859	17,258	1,371,987
Catholic Benevolent Legion.....	1881	48,080	10,115,914
Chosen Friends, Order of.....	1879	22,000	13,277,264
Druids, United Ancient Order of.....	1839	16,245	† 4,000,370
Elks, Benevolent and Protective Order of.....	1868	60,000	750,000
Foresters, Ancient Order of.....	1745	900,000	‡ 108,500
Foresters of America.....	1864	163,464	7,691,050
Foresters, Independent Order of.....	1874	163,610	8,064,383
Free Sons of Israel, Independent Order of.....	1849	11,208	3,328,000
Good Fellows, Royal Society of.....	1892	10,133	3,946,438
Heptasophs, Improved Order.....	1878	52,690	4,183,384
Hibernians of America, Ancient Order of.....	* 1695	890,000	2,150,000
Home Circle.....	1879	5,816	2,000,000
Irish Catholic Benevolent Union.....	1869	14,623	2,681,835
Knights and Ladies of Honor.....	1877	60,000	16,112,788
Knights of Honor.....	1873	66,863	69,232,101
Knights of Malta, Ancient and Illustrious Order.....	1048	25,000	.....
Knights of St. John and Malta.....	1863	4,284	367,487

* In Ireland.

† Since 1847.

‡ Since 1836.

NAME OF ORGANIZATION.	Date of Founda- tion.	Membership.	Benefits Dis- bursed since Organization.
Knights of the Golden Eagle.....	1873	60,000	\$1,704,417
Knights of the Maccabees.....	1878	406,064	14,372,191
Ladies' Catholic Benevolent Association.....	1890	50,000	1,023,242
Mystic Circle, The Fraternal.....	1884	12,000	1,505,963
National Provident Union.....	1868	3,300	1,715,184
National Union.....	1881	53,040	11,344,319
New England Order of Protection.....	1867	27,784	2,343,854
Pilgrim Fathers, United Order of.....	1879	24,164	3,652,431
Rehabites, Independent Order of.....	1885	180,000	3,619,738
Red Men, Improved Order of.....	1771	213,679	16,079,076
Royal Templars of Temperance.....	1870	22,433	7,261,559
Scottish Clans, Order of.....	1878	5,330	620,000
United American Mechanics, Order of.....	1845	55,000	155,400
United American Mechanics, Junior Order of.....	1863	183,508	3,619,738
United Workmen, Ancient Order of.....	1868	373,289	94,041,634
Woodmen of America.....	1863	446,346	15,199,885

FRATERNITIES, COLLEGE, OR GREEK-LETTER SOCIETIES, are peculiarly an American institution, having no counterpart in the student societies of foreign universities or colleges. They differ from all other American secret societies also, and social and educational qualities play an important part in their organization. There are over two score important ones and nearly as many more which are less known. The Greek-letter fraternity is supposed to have sprung indirectly from Freemasonry, but it is widely different from that order. The first society, Phi Beta Kappa, was founded in 1776 at William and Mary College, whence it spread to Yale, Harvard, and other institutions, becoming finally a college honorary society. The modern college fraternity has risen since the first quarter of the century, and has lost its early literary tendency and become almost a purely social body. Its influence on the undergraduate life, however, is often very great, and the antagonism of college authorities toward it is fast giving way to an opposite tendency. The chapter houses or lodges, as they are sometimes modestly called, are frequently of great beauty, and in many institutions serve as halls of residence as well as common meeting ground for the members. Two criticisms aimed at the Greek-letter societies are, first, their tendency to produce cliques among the students, which in turn destroys college spirit; and, second, the danger of their fostering false aristocratic ideas and habits of extravagance. At the large universities the spirit of cliquishness is disappearing before the broader student life which generally exists, and at the smaller colleges the evil is said to be overestimated. In most cases it is probably counterbalanced by the advantages of fraternity life, such as social training and the formation of close friendships. As to the second objection, it may be said that the aggregate value of fraternity holdings is in the millions, being at one university alone over three-quarters of a million dollars. The financial policy of the chapters is generally in the hands of alumni, however, and the burden on the undergraduate is not very great outside his regular dues. It is the testimony of fraternity men that society members are not, on the whole, more extravagant than other college men, and while the wealthier students are naturally sometimes in the majority, no student is ever barred from a good chapter on account of money considerations. Princeton is the only one of the larger colleges which has no secret fraternities. These were abolished by the faculty some years ago. At Yale and Harvard the societies are generally in the form of clubs or of class societies, and while membership therein is highly prized, the chapters are not closely affiliated in all cases with the main organizations. There is not space to mention all the college fraternities, but some of the more important general societies are placed in tabular form below, the statistics for 1898, the latest obtainable, being taken from Baird's *American College Fraternities*. They are named in the general order of their founding. Few new fraternities have been formed in recent years.

Fraternity.	Members.	Active Chapters.
Kappa Alpha.....	1,395	4
Sigma Phi.....	2,190	7
Delta Phi.....	2,914	11
Alpha Delta Phi.....	7,933	19
Psi Upsilon.....	8,585	17
Delta Upsilon.....	6,275	26
Beta Theta Pi.....	10,577	60
Chi Psi.....	3,718	16
Delta Kappa Epsilon.....	12,948	34

small volume the salient features of all the campaigns of the Revolution and the empire. But the Napoleonic period is not the only one which has received important treatment: the past year has seen new volumes added to three historical works of lasting value. The first of these is Émile Ollivier's *L'Empire Libéral*, of which three volumes had previously appeared; the fourth, which was issued last July, under the title *Napoléon III. et Cavour*, not only contains the history of the establishment of Italian unity, but draws the physiognomy of the Emperor with such profound insight as to render the work indispensable to future students of the period. Of importance also are the fourth volume of Pierre de la Gorce's *Histoire du Second Empire*, which emphasizes the influence of the unfortunate Mexican expedition; and *Louis XIII.: Marie de Médicis, Richelieu Ministre*, which forms the fourth volume of his *Histoire de Louis XIII. et Marie de Médicis*, the preceding volumes being I. *Marie de Médicis et Sully*; II. *Marie de Médicis et Villeroy*; III. *Marie de Médicis, Chef du Conseil*.

Other interesting volumes are: *La Présidence de Jules Grévy*, by E. Zevort, rector of the Academy of Caen, which forms the third volume of a history of the third Republic, the previous two dealing with Thiers and MacMahon; *François II.*, by the Marquis René de Belleval, which constitutes the first part of an extensive work dealing with "the sons of Henry II., the Court, the City, and the Society of their Time;" and the initial volume of a new history of France, by the Vicomte de Caix and Albert Lacroix, *La France avant l'Histoire et la Gaule Indépendante*, in which the aid of geology, palæontology, and ethnology has been invoked to reconstruct the picture of these prehistoric times. Lastly, M. Frantz Funck-Brentano, who in 1898 published a curious volume of *Legendes et Archives de la Bastille*, gave us in 1899 a really unique work, *Le Drame des Poisons*, which, according to the sub-title, is a series of "studies of society in the seventeenth century, and more particularly the court of Louis XIV. in the light of the archives of the Bastille."

Biography.—A convenient transition from history to biography is offered by a certain class of memoirs, in which the year 1899 was unusually fertile. Those belonging to the Napoleonic epoch seem to be inexhaustible; this year we have: *Sainte-Hélène: Journal Inédit du Général Baron Gourgaud*, who, during the three years from 1815 to 1818 shared Napoleon's exile, and shows us the Emperor more violent, more irritable, more intolerant of contradiction than any writer has hitherto painted him. Under this head also belong *Lettres Inédites de Napoléon Ier*, by M. Léonce de Brotonne. It contains upward of 1500 letters, which the commissions of 1854 and 1864 had not thought it necessary to include in the official collection of the Emperor's correspondence. "The best proof of the impartiality of our work," said Prince Napoleon, after having completed the task of editing *La Correspondance de Napoléon I.*, "would be the publication of the letters which we have omitted; the shadows would bring out the light of the picture; it would be the most favorable judgment for the memory of the Emperor." The wish has now been realized by the publication of this new volume of letters, but it may be gravely questioned whether the new light thrown by them is to the Emperor's credit. Another work of historic importance is *Journal et Souvenirs sur l'Expédition d'Égypte (1761-1801)*, by E. de Villiers du Terrage, who was a member of the Commission of Sciences and Arts that Napoleon took with him to Egypt. Other memoirs deserving mention are those of Mme. de la Ferronnays, daughter-in-law of the ambassador who represented Charles X. at the court of Russia; of the Comte de More, covering the years 1758-1837, part of which were first published in 1827; and those of the Lieutenant-Général Vicomte de Reiset (1775-1810), edited by his grandson, the present Vicomte de Reiset.

The biographies of two princesses which possess considerable historic interest are *Madame Louise de France*, the last daughter of Louis XV., and Marie Leckzinska, written by Léon de la Briere, and *La Dernière des Condé*, by Pierre de Segur, which sketches the brief and pathetic career of the last of her line, the Princess Louise-Adelaide de Condé. Lastly, M. Th. Batbedat has celebrated the thirtieth anniversary of the opening of the Suez Canal by a timely and, on the whole, adequate biography, *Lesseps Intime*, full of curious illustrations and anecdotes.

Literary Criticism.—There are several volumes which partake equally of the character of criticism and biography, and one of the most important is Alfred Rebillion's admirable *Bossuet*, in the Grands Ecrivains Français series. From the time when M. Rebillion chose as a subject for his university thesis, *Bossuet, Historien du Protestantisme*, he has identified himself in one way or another with the author of *Oraisons Funèbres*; so that when the time came to add this volume to the series it seemed not merely desirable but almost foreordained that the choice should fall upon him. The chief merit of the book is due to the fact that the author has emancipated himself from tradition, and refuses to give us the conventional Bossuet. At the outset he says: "Bossuet was not an exceptional being; he had, like other people, his development, his progress, his variations; . . . he depended upon his age more

than his age upon him. In place of that magnificent but false Bossuet, who has hitherto been shown us, planted, so to speak, like a statue, in the midst of Louis Fourteenth's century, we must substitute the true Bossuet, who changed, who struggled who lived." *La Vie et les Œuvres de Voltaire* is a bulky work in two volumes, by M. L. Crousle, who is professor in the Faculty of Letters at Paris, and shows scrupulous care and great erudition. Two interesting volumes are consecrated to Montaigne: *Introduction aux Essais de Montaigne*, by Edmé Champion, and *Montaigne: Etudes et Fragments*, a posthumous volume by Guillaume Guizot, which embodies all that remains of twenty years' study of the *Essais*, in preparation of a definitive edition of Montaigne's works, which was one of the unfulfilled dreams of Guizot's life. *Trois Idées Politiques* is the title which M. Ch. Maurras has found to hold together his three essays upon Chateaubriand, Michelet, and Sainte-Beuve. Gustave Larroumet contributes a volume of *Nouvelles Etudes d'Histoire et de Critique Dramatiques*, including essays on the New Comedy, on Hervieu, Donnay, and Richepin, on Duse and Novelli. A volume of literary studies which deserves a passing word of praise is *Humor et Humoristes*, by Paul Acker, containing skilfully drawn characterizations of such writers as Jules Renard, Alfred Capus, Tristan Bernard, Pierre Veber, and others belonging to that group. Ferdinand Brunetière's recent articles upon history and literature have been collected into a volume, while Gaston Deschamps has, between his weekly studies of "La Vie Littéraire" in the *Temps*, found time to give us a political treatise, *La Malaise de la Démocratie*. Lastly there is a *Balzac Ignoré*, by Dr. Cabanès, and *Les Eléments d'une Renaissance Française*, by Saint-Georges de Bouhelier, the contents of which range from Jean Jacques Rousseau to Zola, from General Boulanger to Gabriele d'Annunzio.

Poetry.—There is a lamentable dearth of good poetry this year. A notable exception is Maurice Rollinat, who, after a prolonged silence, has produced a volume of *Paysages et Paysans*. He is pre-eminently a singer of rural splendors and delights, and in his latest book has preserved the strange accent which made his earliest poems so distinctively his own. Other poets who, like Rollinat, suggest the scent of broom and heather, are François Fabié, professor at the Lycée of Paris, whose latest volume is *Le Clocher*; Auguste Gaud, author of *Les Chansons d'un Rustre*; and Adolphe Métié, whose amusing dialogues in the patois of Poitou, *Poitevins d'Auf' fait* (Les Poitevins d'Autrefois), are unfortunately wholly intelligible only to a Poitevin like himself. André Rivoire, a young poet of real promise, has this year contributed a delicious little volume, in which he has amused himself by translating quite freely in ironical "imageries" and sentimental caricatures the old-time poem in which Adénès, king of minstrels, celebrated the misfortunes of *Berthe aux Grands Pieds*. M. Rivoire's verses are so smooth and flexible that they make the original alexandrines of Adénès seem heavy and awkward. Another young poet, Sébastien-Charles Leconte, made his début in the summer of 1899 with *L'Esprit Qui Passe*, which he dedicated to Leconte de Lille, Villiers de l'Isle-Adam, and "the god, Richard Wagner," and which won the half-indulgent, half-ironical approbation of Gaston Deschamps. The following also deserve casual mention: *Les Perles Rouges*, a volume of sonnets by Robert de Montesquiou; *Les Heures Aimées*, by the Baroness de Baye; *Fleurs de Corail*, being impressions which the author, Maurice Olivaint, brought back from a sojourn among the islands of the South Pacific; *Les Heures d'Amour*, by Fernand de Rocher, and *La Bretagne Enchantée*, by Paul Sébillon.

Fiction.—The annual flood of novels is as formidable as ever during 1899, but taken as a whole the quality seems to be scarcely up to the level of the preceding year. Many of the foremost writers have given nothing of importance; among others, Paul Bourget and Marcel Prévost have remained silent. On the other hand, we have had some important volumes from Anatole France, Edouard Estaunié, René Bazin, Eugene-Melchior de Vogüé, a posthumous volume of Maupassant, and what was perhaps the most widely discussed of them all, Emile Zola's *Fécondité*. This was the first of Zola's long-heralded "*Quatre Evangiles*:" Fruitfulness, Work, Truth, and Justice, in which he proposed to follow respectively the fortunes of the four sons of Pierre Froment, the hero of *Lourdes*, *Rome* and *Paris*. The central theme of *Fécondité* is of course the steadily increasing depopulation of France, with all its causes; and these are set forth and discussed with a frankness which would make the volume intolerable in English dress, outside the shelves of a medical library. As for plot, it is less a novel than a family chronicle, in which we follow the history of Pierre's son Matthew and his descendants unto the third and fourth generation; for Matthew and his wife literally interpret the scriptural injunction to "be fruitful and multiply," and they live to see children and grandchildren to the number of over a hundred. In France the book has been received seriously and has made a considerable impression. The veteran critic, Gaston Deschamps, in reviewing it pointed out that "there are two men in the author of *Pot-Bouillé* and *Fécondité*, one of whom takes pleasure in descending to the strangest crudities of thought and of language, while the other rises naturally to lyric heights and the simplicity of the

epic;" and he thinks that in *Fécondité* the poet has decidedly gained the upper hand over the naturalist.

Zola is not the only writer to seek a subject this year in serious social problems. In *La Terre Qui Meurt*, M. René Bazin deals with the depopulation of the country districts, and gives a graphic picture of that district of Marais which is gradually dying, because by slow degrees the peasants are becoming disgusted with the country and are leaving it. Another book which must be classed distinctly as a social novel is Edouard Estaunie's *Le Ferment*—the "ferment" in question being the restless intelligence of the sons of peasants and laborers, whom over-education has rendered discontented with the lot of their parents, and has filled with longings and desires which they are unable to gratify. Anatole France also touches upon certain social and political problems in *L'Anneau d'Améthyste*, the third volume in his inimitable series of *Histoire Contemporaine*, to which his articles now running in the *Figaro* will probably soon form a fourth. There are few writers who have attained Anatole France's skill in the use of that delicate weapon, satire, and the element of comedy which he blends with his attacks upon the foibles and vices of his race is irresistible. Among other novels which call for special mention are *Basile et Sophie*, Paul Adam's brilliantly colored picture of the most dissolute years of the Byzantine Empire; *Lagibasse*, by Jean Richépin, which the author has chosen to label as a "roman Magique," and which takes the reader through such hidden realms of telepathy and occultism as to leave him with the sensations of having passed through a nightmare; and *Père Milon*, the first of a promised series of posthumous stories by Maupassant, the bulk of the present volume being made up of studies which he afterward utilized in other form, many of them as scenes and chapters in his novel *Une Vie*. Among the younger novelists, François de Nion, who came into sudden notice last year with *Les Façades*, has confirmed public opinion by a careful piece of work in the field of the historical novel, *Les Derniers Trianons*, which professes to be the romance of "a friend of Marie-Antoinette," and gives an admirable picture of social life in the reign of Louis XVI. Louis de Robert is another writer of the younger group who has shown distinct promise. His latest story, *La Reprise*, concerns itself mainly with a young wife who fails to feel any stir of emotion for her husband until she has been divorced and is married to another man. The treatment of the theme shows distinct promise, but unfortunately the psychological school of fiction is distinctly on the wane. Still another story, *Le Page*, by a comparatively new writer, Marcel Boulanger, has attracted considerable notice, and has been compared in certain particulars to *Le Lys Rouge*, of Anatole France. The inexhaustible Gyp gives us a characteristic volume in *Monsieur de Folleuil*; Hugues le Roux has found time, in addition to his sociological study, *Le Bilan du Divorce*, to write a romance, *Jeunes Amours*; and last but not least there is a new volume by Pierre Loti, *Reflets sur la Sombre Route*.

The following novels also deserve enumeration: Henri Ardel, *L'Heure Décisive*; Simon Boubée, *La Dame aux Rubans Rouges*; "Brada," *Une Impasse*; Henry Buteau, *Mère Poudrée*; Th. Cahu and Louis Forest, *L'Oubli*; Félicien Champsaur, *Poupée Japonaise*; Albert Cim, *Emancipées*; Louis Enault, *Un Drame au Marais*; Mme. Octave Feuillet, *Une Divorcée*; Mary Floran, *La Plus Riche*; André Foulon de Vaux, *Madame de Lauraguais*; Remy de Gourmont, *Le Songe d'une Femme*; Henry Gréville, *Petite Princesse*; Léon Hennique, *Minnie Brandon*; Georges Lecomte, *Suzeraine*; Mme. Lescot, *Sublime Mensonge*; Octave Mirabeau, *Le Jardin des Supplices*; Maurice Montégut, *Ami d'Enfance*; M. de Poiseux, *Le Peintre Gabriel*; Jean Psichari, *L'Epreuve*; Hugues Rebelle, *La Calineuse*; Jean Reibrach, *A l'Aube*; Adolphe Retté, *La Seule Nuit*; Art Roë, *Mon Régiment Russe*; Remy Saint-Maurice, *La Maison due Sommeil*; Edouard Schuré, *Le Double*; Léon de Tinseau, *Les Péchés des Autres*; Gaston Volnay, *L'Iris Noir*. See DRAMA.

FRENCH SOUDAN. The vast stretch of territory known as the French Soudan forms a great hinterland to French Guinea, Senegal, and Dahomey, and has a width east and west of 2000 miles, merging in East Africa into the British-Egyptian Soudan. To the north it connects through the Sahara Desert, which is entirely French territory, with French Algeria, and on the south it connects by means of Lake Tchad with French Congo. Thus all Northwest Africa, from the Mediterranean to the Gulf of Guinea, is continuous French territory, excepting Morocco, Liberia, and the territories of Spain, Portugal, Germany, and Great Britain. The French Soudan embraces an area of about 354,000 square miles, with a population estimated at from 3,000,000 to 4,000,000. About 54,000 square miles of this region was originally annexed by France, the included population being about 360,000. The remainder of the Soudan was placed under protectorates. Northwardly, where the Soudan runs into the French Sahara, is a sparsely peopled desert, crossed by numerous caravan trails, which run from one oasis to another. Southwardly the Soudan becomes well populated, and is watered by the Senegal and by the Niger, the third

largest river in Africa. On this river is Timbuctoo, with navigation to the coast, which was once an extremely important trading station, with an annual commerce estimated at \$20,000,000. Inter-tribal wars have almost entirely destroyed this once valuable trade, and Timbuctoo has become a comparatively unimportant centre. Under French protection and rule the Soudan, it is expected, will regain much of the commerce of former days, when trade with the interior tribes will rapidly increase. A railroad has been partly built to connect the Senegal with the Niger, and lately a line has been proposed, to run from Konakry, the capital of French Guinea, to the Niger. Important agreements made between France and England took effect in 1899, whereby the limits of the Soudan are more definitely fixed than before. This was done by the definite location of the line separating French Dahomey and English Lagos. For the final decision and its relation to the Soudan see NIGER TERRITORIES. A second Anglo-French controversy arose out of the Marchand expedition across the Soudan to Fashoda, which was settled in 1899 by the erection of a definite north and south boundary line, passing between Darfur in Egyptian Soudan, and Wadai, which is thenceforth considered as in the French Soudan. The French were excluded from that part of the Soudan which had been temporarily evacuated by Egypt after her recent wars there, but France was given equal commercial privileges with Great Britain on the Nile and its confluent. (See further the article EGYPT.) Several important political happenings are recorded for the Soudan in 1899. The Voulet-Chanoine mission was undertaken for the purpose of putting an end to certain disorders which had developed in the previous year, and which resulted in the murder of a French captain, Caze Majou, and also to insure the effective occupation of this region. On July 14 the expedition had reached the 14th parallel of latitude, midway between the Niger and Lake Tchad. Charges of misconduct on the part of the chiefs of this mission having reached the authorities, Colonel Klobb, accompanied by Lieutenant Meunier, was sent to make an inquiry and to take command of the mission. Captain Voulet warned Colonel Klobb on hearing of this order that he would not submit. When the latter had advanced with his little column, consisting solely of thirty Senegalese riflemen, Voulet gave the order to fire, and Colonel Klobb, as well as Lieutenant Meunier, fell mortally wounded. In the foreign press this crime was taken as a sign of the confusion that reigned in the government of the colonies. On the whole, however, the incident was most exceptional, and stands out in marked contrast to the general conduct of French soldiers in Africa. Voulet and Chanoine, after having been outlawed by the French government, were shot by some of their own men some time in October, 1899. By the governmental decree of October 17, French West Africa was reorganized by abolishing the separate status of the colony of the French Soudan. The reasons for this decree were that the French authority was so well established in that region that there was no danger henceforth of serious resistance at the mouth of the Niger; that the French territory, from the hinterland of Morocco to the western coast, was continuous, and that a regular network of telegraph lines united the colonies on the coast with Senegal; that it seemed possible to attach the French Soudan to the coast colonies of Senegal, French Guinea, Ivory Coast and Dahomey. Two military districts were excepted from the operation of this decree—namely, those whose capitals are Timbuctoo and Wagadougou, which are to be under military commandants. This decree was taken as a sign that the period of military administration had closed, and that the time had come for giving this region a civil government and looking to its economic developments. The principal difficulty has been with the natives in the vicinity of the Lake Tchad region, where a native chief of considerable ability had set up a strong government. Three officers and twenty-seven Senegalese officers were murdered in 1899 in Central Soudan. Late in 1899 it was reported that the early permanent subjection of the unruly tribes in this portion of French Africa was certain.

FRIENDS, SOCIETY OF, generally known as Quakers, has four principal divisions—the Orthodox Friends, which in 1899 had 1279 ministers, 830 churches, and 92,344 church members; the Hicksite Friends, with 115 ministers, 201 churches, and 21,992 members; the Wilburite Friends, with 38 ministers, 53 churches, and 4329 members, and the Primitive Friends, with 11 ministers, 9 churches, and 232 members. The next biennial conference is to be held in the summer of 1900 at Chautauqua. An educational conference was held in the summer of 1899 at Providence, R. I. A new constitution and discipline was adopted in 1899 for the American yearly meetings, which is intended more closely to unite all the 14 independent bodies of the Orthodox Friends. The new discipline provides for the harmonious following out of the efforts to civilize Indians, securing peaceful substitutes for war, and other aims. There was a notable growth of Young Friends' Associations, that of Philadelphia having completed during 1899 a \$100,000 building. The latest report of the commissioner of education (1899) shows the Friends to have 7 institutions of learning with 90 professors, 782 students, and endowment funds aggregating \$1,177,000.

FRUIN, ROBERT, Dutch historian, died in Leyden, January 29, 1899. He was born in Rotterdam on the 14th of November, 1823; he studied in Leyden and became in 1850 a high-school teacher in that city and in 1860 professor of Dutch history in the university. He relinquished his professorship in 1893. For a time Professor Fruin served under the government as Holland historian. He published periodically a number of valuable articles on the history of the republic and on the history of law in the middle ages. His principal work is *Tien jaren uit den 80-jarigen oorlog*, 1861. He revised the *Bijdragen voor vaderlandsche geschiedenis*.

FULLER'S EARTH. Florida continues to produce the greatest quantity of the native earth, the output for 1898 being 14,860 long tons, valued at \$106,500.

FUNSTON, FRED, brigadier-general, U.S.V., who in 1899 was in command of the Twentieth Kansas Volunteer Regiment in Luzon, is the son of Mr. Edward H. Funston, member of Congress from Kansas from 1884 to 1893, and was born in Ohio, November 9, 1865. His family moved to Kansas in 1867. Young Funston was graduated in 1886 from the Iola High School, and then studied for two years at the Kansas State University, Lawrence. In 1890 he was a reporter in Kansas City, and the next year joined the United States expedition to the Death Valley of California; the party suffered great hardships. In 1893 Funston was one of the commissioners sent out by the Department of Agriculture to explore Alaska and report on its flora; the following winter—1893-94—he was in camp on the Klondike and floated down the Yukon alone in a canoe. Subsequently he appeared as a lecturer and for a time was a railroad employee. In 1896 he joined one of the Cuban filibustering expeditions, so called, and fought for eighteen months under General Gomez, especially distinguishing himself at Guimara and taking part in twenty-one other engagements. He was wounded and suffered from Cuban fever. Disgusted with the Cubans on account of the execution of some prisoners, he left the army, but was captured by the Spaniards. He soon, however, succeeded in reaching New York. In 1898 Funston was commissioned colonel of the Twentieth Kansas Volunteers, which regiment was mustered in on the 13th of May, and with it was ordered to the Philippines. The regiment took part in the capture of Manila in August, and after the outbreak of February 4, 1899, was active in the operations against the insurgents. Colonel Funston distinguished himself on several occasions, his gallantry culminating on April 26, when though under heavy fire he and a few followers swam across the Rio Grande River before Calumpit, in order to make fast a rope by which the Americans could guide rafts across the stream, for the bridge had been wrecked and the Rio Grande was not fordable. The Americans crossed over, and Calumpit was taken. In reporting the battle, General E. S. Otis said that the passage of the river was "a remarkable military achievement, the success of which was due to the daring, skill, and determination of Colonel Funston." In recognition of Funston's services, President McKinley on May 2, 1899, advanced him to the rank of brigadier-general of volunteers. Later in the year General Funston returned to the United States, and on November 2 was presented with a sword by the State of Kansas.

FURNACES, GARBAGE. See GARBAGE AND REFUSE COLLECTION AND DISPOSAL.

GABOON. See FRENCH CONGO AND GABOON.

GALLIFFET, GASTON ALEXANDRE AUGUSTE, MARQUIS DE, French general, assumed the portfolio of war in the ministry organized by M. Waldeck-Rousseau on June 22, 1899. At this time he was regarded as a believer in the innocence of Alfred Dreyfus, but as an advocate of a conciliatory policy. The general is, however, a man of much force and insists on strict military discipline. He has been credited with monarchical sympathies, but in 1899 the Duke of Orleans tried in vain to enlist his support.

General Galliffet was born in Paris, January 23, 1830; he entered the army in 1848, served in the Crimean War, and in 1863 took part in the war in Mexico. In 1867 he was made a colonel, and was given command of a regiment, which in 1870 was part of the Army of the Rhine. Promoted to brigadier-general in August of the latter year, he distinguished himself at Sedan on September 1 in an attack of French cavalry on the Prussian infantry at Floing, but his daring resulted in capture. After being liberated, he received in March, 1871, the command of a brigade in the Army of Versailles, and was given the task of putting down the Commune. In this work he acquitted himself with courage and skill, but got a reputation for cruelty. He was then sent to Africa, and in the winter of 1872-73 undertook a daring expedition to El Colea. After the reorganization of the army, he received in 1875 the command of the Fifteenth Infantry Division in Dijon, and in 1879 became commander of the Ninth Army Corps in Tours. In 1882 he resigned the command of the troops in Paris, to which he had been appointed two years before, and continued merely as a member of the council of war and as president of the committee on cavalry. From this position he was removed in 1886 by the Radical minister of war Boulanger.

The new French cavalry rules of 1882 were written by General Gallifet. He is one of the foremost generals in France.

GALTON, Sir DOUGLAS, D.C.L., LL.D., F.R.S., a well-known English engineer, died March 10, 1899. He was born in Worcestershire in 1822; was educated at Geneva, at Rugby, and at the Royal Military Academy, Woolwich, passing in the last-named institution the highest examination on record. He was commissioned in the Royal Engineers in 1840, was engaged in work upon the fortifications of Gibraltar in 1843, and four years later served under the Railway Commission. In 1856 he became inspector of railways and secretary of the railway department of the Board of Trade, at which time he made an official visit to the United States. He was made assistant inspector-general of fortifications in 1860. Soon after this he designed and constructed the Herbert Hospital at Woolwich. From 1862 to 1870 he was assistant under-secretary of state for war, and later became director of public works and buildings, retiring in 1875. From 1870 to 1895 he was general secretary of the British Association for the Advancement of Science, and its president in 1895-96. He was a member of the council of the Royal Society; was created a K.C.B. in 1887. He was a recognized authority on sanitary engineering. He wrote *Healthy Dwellings* and *Healthy Hospitals*.

GAMBIA. The British colony of Gambia, the oldest and the most northerly of England's settlements on the West African coast, has an area of only 69 square miles, with a population given in 1894 as 14,978. There is a surrounding sphere of influence possessed by Great Britain in the interior, making a total area for the colony and protectorate of about 2700 square miles, with a population estimated at 50,000. Gambia was first discovered by the Portuguese, and was acquired by the British in the seventeenth century. It is governed by an administrator, assisted by an executive and a legislative council. In 1888 it was separated from the West African settlements and made a separate colony. Its chief town is Bathurst, which is situated on the island of St. Mary and has 6000 inhabitants. Gambia is of some importance, since it commands the Gambia River, up which ocean steamers may freely pass. Trade in Gambia, according to statistics in *Commercial Africa in 1899*, published by the United States Treasury Department, now shows a fair return, although the country is capable of much more development than has been given it. For a time succeeding 1892 both revenue and trade fell off slightly, but in 1897 the imports amounted to \$681,310 and the exports, \$798,106 (exclusive of specie). The average for the five previous years was: Imports, \$559,648; exports, \$691,043. The principal product, ground nuts, in 1897 was exported to the amount of 20,000 tons, a gain of 8000 tons in one year. The export of rubber also improved. Other exports are hides, beeswax, rice, cotton, and corn. Gambia imported about 50 per cent. of its goods from Great Britain, and about a third of her exports were sent there. This class of trade increased in 1896-97 over \$160,000, or about one-third. The proportion of whites in the population is small, but considerable missionary work has been done among the natives. In 1890 there were 2385 Christians in Gambia and about 5300 Mohammedans.

GARBAGE AND REFUSE COLLECTION AND DISPOSAL. In England some of the municipal authorities are working toward the abolition of horses for the collection of ashes, garbage, and other refuse, and the substitution of motor vehicles for the purpose. One or two places in England have put "dust motor vans," as they call them, into service. The authorities in these towns urge that the departments responsible for cleaning the streets should set the example of doing away with the chief cause of dirty and dusty streets—namely, horses. Statistics collected in 1899 by H. J. Gondon, and presented in a paper read before the League of American Municipalities, show that of 37 of the largest cities of the United States, 5 have no public provision for garbage collection; 18 collect by means of public, and 1 by private contractors; in 12 the municipality does the work, and in 1, New York, both systems exist. As to final disposal of garbage, 8 cities employ reduction processes (producing grease and fertilizing material), 6 cremate, 7 dump on land, 3 dump in water, 3 bury in the earth, and 6 feed to swine. In over half of the 37 cities no provision is made for collecting refuse other than garbage. Twelve cities collect through contractors and 4 direct.

In England, and, to a lesser extent on the continent of Europe, there is an increasing practice of utilizing the heat from garbage furnaces or refuse destructors for power for electric stations, and for other purposes. Scarcely any progress in that line has been made in America. In fact, the bills for fuel for most American garbage furnaces are very high, and hitherto it has not been practicable to make the garbage itself serve as fuel for other undertakings. Part of this difference between European and American practice is due to the fact that our garbage and refuse contains less combustible matter than that abroad, besides being heavily laden, oftentimes with moisture, which must, of course, be evaporated before the

waste can be burned. The practice of separating garbage from ashes and light combustible refuse from the first two forms of waste is being extended in this country, but is practised, scarcely at all abroad. It is essential that this should be done wherever the garbage is to be reduced to grease and fertilizers, as the other wastes are not only useless for this purpose, but very objectionable as well. The ashes, if kept clean, can be used for filling, thus lessening the distance and expense of hauling, as well as the cost of final disposal, while the combustible wastes may be burned with ease after sorting out the paper, rags, and other material which has a market value. This sorting and burning process has continued in use for a section of New York during 1899, and also for the greater part of Boston. The Brighton district of Boston and the town of Brookline will hereafter be served by a second plant of this character.

GARLAND, AUGUSTUS HILL, one of the foremost lawyers in the United States, and ex-attorney-general, died January 26, 1899, from an apoplectic stroke suffered while addressing the Supreme Court in Washington. He was born at Covington, Tenn., June 11, 1832. The next year his family moved to Washington, Ark. He was educated at Bardstown, Ky., and at the colleges of St. Mary and St. Joseph. In 1853 he was admitted to the bar in his home town, and three years later changed his practice to Little Rock. Not only in the controversies that preceded the Civil War, but in the Arkansas convention, that finally declared for secession, Mr. Garland opposed a withdrawal from the Union. When the secession of Arkansas became a fact, however, he stood with the State, and was one of its representatives in the provisional congress held at Montgomery, Ala., in 1861. He served in both branches of the Confederate Congress, being a senator in 1865. He began again the practice of law in Little Rock, and in 1867 was elected to the United States Senate, but was not allowed to take his seat. In 1874 he was elected governor of his State, and two years later was sent again to the Federal Senate, when he took his seat without opposition. He was re-elected, but in 1885 was called by Mr. Cleveland to serve as attorney-general. He held this office until the end of the administration in 1889.

GAS, ILLUMINATING AND FUEL. The gas companies have less to fear from competition with electricity than formerly. This is due largely to the rapid introduction of incandescent gas burners, which increase the brilliancy and cheapness of gas lighting and decrease the net cost of production. The two important factors in the latter process are the value of the by-products and labor-saving appliances for handling coal and other purposes. The price of gas is going steadily downward, and might go still farther if the enormous amount of waste, through leakage, could be reduced. To the latter end many of the most able gas men are now turning their energies. The leakage is chiefly in pipe distribution systems, many of the gas mains being old and most of them, whether old or new, having been laid with too little attention to making tight joints. In the best work great pains are taken to prevent leakage, but generally still more money could be expended here with great advantage. It has recently been proposed that great savings in construction might be effected by distributing gas under heavier pressures, thus reducing the size of the mains. If this were feasible, as some good engineers believe, the replacing of leaky mains by tight ones would be facilitated.

Acetylene gas is coming into use for lighting isolated buildings, and has been adopted for lighting a few small towns that are without ordinary coal-gas facilities. English figures place the cost of lighting by acetylene at \$7.07 per 1000 cubic feet for material alone and at \$8.02 in the holder, including depreciation of plant in the latter case. On this basis the cost of a given amount of light from acetylene would be equivalent to coal gas at 61 cents per 1000 cubic feet, provided 31 candle-power burners were used, or double that for 8 candle-power burners. See CALCIUM CARBIDE.

GAS, SEWER. See SEWER GAS.

GATAORE, Sir WILLIAM FORBES, K.C.B., major-general in the British army, had an important command in the Boer war during the latter part of 1899. On November 28 he occupied Bushman's Hoek, Cape Colony, the Boers retreating. On December 10, near Stormberg junction, he suffered a serious reverse, which was one of the three great disasters to British arms during the month—the other two being the defeat of General Methuen on the 12th, at Magersfontein, and that of General Buller on the 15th near Chieveley on the Tugela. The reported British casualties at Stormberg, including 672 prisoners, were 687.

General Gatacre was born in 1843, and entered the Seventy-seventh Foot in 1862. From 1875 to 1879 he was an instructor in surveying in the Royal Military College at Sandhurst. In 1888 he was deputy adjutant and quartermaster-general in the Hazara expedition, for his services in which he was made a Companion of the Distinguished Service Order and was awarded a medal with clasp. In 1889 he served in Burmah. For his work in Chitral in 1895, having commanded at Mamugai the

passage of Janbatai and the Lowari passes, he received more honors, and was made a Companion of the Bath. During the first advance on Atbara, in 1898, General Gatacre had a command in the Soudan; and later in the year he commanded a British division in the Soudan during the advance to Khartoum and Omdurman. In 1898 he received the command of the southeastern district in the British army, his last command before taking the field against the Boers.

GEMÜNDER, GEORGE, a famous violin-maker, died at Astoria, L. I., January 15, 1899. He was well known throughout the musical world, and made violins for many famous musicians, including Remenyi, Ole Bull, and August Wilhelmj. Gemünder was born at Ingefingen, Würtemberg, April 13, 1816, and studied under his father, a maker of string instruments. After his father's death, about 1835, George went to Vienna, Munich, and Presburg, and finally settled at Strasburg. It was not long, however, before he succeeded in securing a position under Guillaume, the noted violin-maker of Paris, where his talent was greatly developed. He came to the United States in 1845, and after a time settled in Boston. In 1851 he sent to the exposition at London violins in imitation of the works of Guarnerius, Stradivarius, and Nicholas Amati, and received special award. Gemünder removed to New York in 1852, and here he was visited by many famous violinists, including Thalberg, Spohr, and Vieuxtemps. He was eminently successful in his imitations of Stradivarius and Amati violins, and was wont to amuse himself by deceiving experts until they were at the point of buying the instruments; indeed, the violin he sent in 1873 to the Vienna exposition, made in imitation of a classic instrument, was declared by the committee of experts to be not a modern violin, but a genuine Guarnerius. He continued active work until 1894. It is said that Gemünder's violins won the highest prizes at ten world's fairs. His brother August died in 1895, and biographical articles written then confused the two men. August was a manufacturer of pianos and double basses.

GEOFFRION, CHRISTOPHE ALPHONSE, D.C.L., prominent Canadian lawyer, and member of the Dominion cabinet without portfolio, died at Dorion, July 18, 1899. He was born at Varennes, November 23, 1843; was educated at St. Hyacinth College, and in 1868 was graduated in law at McGill University. In 1866, however, he had been admitted to the bar, and he subsequently attained a place in the foremost rank of Canadian lawyers. He was a Liberal in politics.

GEOGRAPHICAL DISTRIBUTION. See ZOOLOGICAL LITERATURE (paragraph Special Treatises).

GEOLOGICAL SOCIETY OF AMERICA, founded in 1888, had in 1899 a membership of 239, and published Vol. XI. of its *Bulletin*. General meeting for 1900 to be held at New Haven, Conn., December 27. President, B. K. Emerson, Amherst College; secretary, H. L. Fairchild, University of Rochester, New York.

GEOLOGICAL SURVEYS. During 1898 and 1899 the various State and government surveys have continued to increase in practical value, the economic side of the various geological investigations undertaken by them receiving special attention. This is evidenced by the following publications, which have appeared during 1899:

United States Geological Survey.—The following monographs appeared: *Geology of Old Hampshire County, Mass.*; *Geology of the Aspen Mining District*; *The Later Extinct Floras of North America*; *The Yellowstone National Park*. Irrigation Bulletins: *Irrigation Near Merced, Cal.*; *Experiments with Windmills*; *Wells of Northern Indiana*; *Sewerage Irrigation, Pt. II.*; *Water Right Problems of the Big Horn Mountains*; *Water Resources of the State of New York, I. and II.*; *Wells of Southern Indiana*; *Operations at River Stations in 1898*; *Wells and Windmills in Nebraska*; *Water Resources of the Lower Peninsula of Michigan*. Annual Reports: Vol. XIX., Pts. 1, 4, 6, and 6 continued; Vol. XX., Pt. 6.

Among the reports which have been issued by the various State Geological Surveys during the past year, the following may be mentioned:

Alabama.—Report on Iron Making in Alabama; Map of Warrior Coal Field.

Georgia.—This State has issued two bulletins, one on the clays of southern Georgia, the other on the artesian wells of Georgia.

Indiana.—The Twenty-third Annual Report of the State Geologist deals entirely with the coal deposits of Indiana.

Kansas.—Annual Bulletin on the Mineral Resources of Kansas for 1898, and Special Report on the Gypsum Industry of Kansas.

Michigan.—Vol. VI., containing a report on the Geological Structure of Isle Royale and Keweenaw Point, and one on the Calcites of the Lake Superior Region.

Minnesota.—Vol. IV. of the final report of the Geology and Natural History Survey.

New Jersey.—The Annual Report for 1898 contains an article on surface geology, artesian wells in New Jersey, water supply from wells, and mineral statistics.

New York.—Vol. II. of the State Geologist's Report for 1895 has appeared, being a monograph on certain paleozoic sponges.

South Dakota.—Bulletin No. 2, containing several reports on different counties, and also one on the limits of the artesian basin.

West Virginia.—Vol. I. contains many valuable data on the geology and on the petroleum and natural gas and well records.

Wisconsin.—Bulletin No. 4, on the building and ornamental stones of Wisconsin.

Iowa.—Ninth Annual Report, containing various county reports, and one on the artesian wells of the Belle Plaine Area.

British Columbia.—Annual Report of Minister of Mines for 1898.

Finland.—Bulletins containing reports on metamorphic rocks of southwestern Finland, and on the elevation of shore-lines.

Great Britain.—Memoir on the Silurian Rocks of Great Britain—Pt. 1, Scotland; Summary of the Progress of the British Geological Survey for 1898.

New South Wales.—The Copper Mining Industry and Copper Ores of New South Wales; Diamonds and Their Occurrence in New South Wales; Notes on Gold Dredging; Report on the Wyalong Gold Field.

New Zealand.—Papers and reports relating to mines and mining, issued by minister of mines.

Ontario.—Report of the Ontario Bureau of Mines, Vol. VIII.

Quebec.—Report on the Mines of the Province of Quebec for 1898.

Sweden.—The Iron Ore Fields of Kiirunavaara and Luessavaara, Sweden.

GEOLOGY. The geological age of the earth continues to be an interesting topic, and in a recent address before the Geological Section of the British Association Sir Archibald Geikie reviewed the matter in a masterly way. Lord Kelvin, who in 1862, in discussing the problem from the physicist's point of view, concluded that the earth's age was not less than twenty and not over four hundred million years, has recently modified his views in placing the maximum age at less than forty, a conclusion not accepted by all physicists. The latter, however, have given singularly little attention to the evidence brought forth by the geologists and palæontologists. An emphatic point made by the former is that it is impossible to discover any indications that geological forces, such as the denudation of the earth's surface, mountain elevation, and volcanic action have acted any more violently or rapidly in the past than they are doing in the present; there is no evidence among the sedimentary rocks of colossal floods, tides, etc., but there is strong proof of continuous orderly deposition, such as can be witnessed to-day in any portion of the globe. The palæontological evidence permits of an equally strong argument in support of the view that the age is fully a hundred million years. One of the great hindrances to the proper solution of the question is the want of proper numerical data, which indicates that much remains to be done, and that innumerable observations must be carried on in the field of experimental geology, both in the field and laboratory. Professor J. Joly discusses the age of the earth since the formation of the ocean, and bases his calculations on the time required to supply to it the amount of sodium now present in the water. His calculations place the age of the earth at eighty-nine million years.

Keyes discusses the value of the term Permian, and points out that while we have in America a great succession of deposits similar to the original Russian Permian, still the two areas had no direct connection during the time of their deposition, and that the Russian Permian constitutes a province by itself, and consequently in a general classification the term can only be considered as of the third order. Prosser correlates the carboniferous rocks of Nebraska with those of Kansas, and Knight shows that the Permian occurs in Nebraska and is an extension of the Kansas area.

Of the geological literature of 1899, the following books may be mentioned: *The Principles of Stratigraphic Geology*, J. E. Marr; *Outlines of the Earth's History*, N. S. Shaler; *Geology for Beginners*, W. W. Watts; *La Geologie Experimentale*, S. Meunier, in which the author discusses in a popular manner a number of geological phenomena both common and rare. The first part of the new text-book of comparative geology by Fritz Frech has appeared, and is entitled *Lethea Geognostica*. Among the important papers are: *Geologic Notes on the Wichita Mountains, Oklahoma, and the Arbuckle Hills, Indian Territory*, T. W. Vaughan; *The Newark Rocks of New Jersey and New York*, H. B. Kummel; *The Crystals Falls Iron-Bearing District*, J. M. Clements and H. L. Smyth, Mon. 19th Ann. Rep. U. S. G. S.; Monograph XXXI. of the United States Geological Survey, on the *Geology of the Aspen District in Colorado*, sets forth in a clear and able manner the structure and mode of occurrence of the ores in this celebrated district; *Geology of the Lake Placid Region*, J. F. Kemp, *Bulletin New York State Museum*, Vol. V.; *Parallelis-*

runge der Meeanbildungen des piemontesischen Tertiars mit dem des Wiener Beckens, F. Schaffer; *Les Massifs du Chettaba et les lits Triasiques de la Région de Constantine*, E. Ficheur; *Sur la Géologie des Terrains Sédimentaires de Madagascar*, M. Beule; *Sur les Klippen des Basses Pyrénées*, C. Authelin; *Geologische Uebersicht des Königsreich Serbien*, J. M. Zujevic. See GLACIAL GEOLOGY and GLACIERS.

GEOGRAPHICAL SOCIETY, AMERICAN, founded in 1852, had in 1899 a membership of 1200. The society aims to encourage geographical exploration and discovery, to disseminate new geographical information, and to establish in a maritime city of the United States a central bureau of geographical knowledge. Corresponding secretary, Chandler Robbins, 11 West Twenty-ninth Street, New York City.

GEORGE ALEXANDROVITCH, Grand Duke and Czarowitz of Russia, brother of Nicholas II., died at the imperial palace at Abbar Touman, in the Caucasus, July 10, 1899. He had always been delicate physically, and as he had latterly contracted consumption, his death for some time had been expected. He was born at Tsarskoie-Selo, April 27, 1871. He became a lieutenant of the first class and a chevalier of the Order of St. Andrew, of the Order of the Elephant, and of the Order of the Black Eagle. He was said to be a prince of unusual intellectual powers and had a genuine interest in naval science. He translated into the Russian language Captain Alfred T. Mahan's *Influence of Sea Power Upon History*. The new Czarowitz, or heir to the Russian throne, is a younger brother of the Emperor, the Grand Duke Michael, who was born in 1878.

GEORGIA, a southeastern State of the United States, has an area of 59,475 square miles. The capital is Atlanta.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 32,494,790 bushels, value, \$16,247,395; wheat, 2,021,225, \$1,980,800; oats, 4,291,857, \$2,060,091; rye, 94,830, \$106,210; potatoes, 257,324, \$213,579; and hay, 158,466 tons, \$2,083,828. Live stock January 1, 1900, comprised, horses, 109,935, value, \$6,001,626; mules, 157,008, \$10,826,032; milch cows, 285,431, \$6,836,072; other cattle, 380,716, \$4,216,054; and sheep, 294,826, \$518,893.

Mineralogy.—During the calendar year 1898 the output of gold was 6221 fine ounces, valued at \$128,600, and of silver, 500 fine ounces of a commercial value of \$646. Quarrying yielded granite to the value of \$339,311; slate, \$13,125; marble, \$656,808, and limestone, \$57,803—in all, \$1,067,047. The production of bauxite in the Georgia-Alabama field was 25,149 long tons, valued at \$75,437; of coal in the Georgia-North Carolina belt, 255,682 short tons, valued at \$212,537, an increase in a year of 38,533 tons; and of iron ore in the Georgia-North Carolina district, a total of 160,083 long tons of red hematite, brown hematite, and carbonate, valued at \$129,468. See ALUMINIUM; ASBESTOS; CLAY.

Manufactures.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$941,726. There were 11 manufactories of tobacco and 85 of cigars, and the production was 3,285,597 cigars, 85,650 cigarettes, 178 pounds of plug tobacco, and 10,257 pounds of smoking. The fruit and grain distilleries in operation numbered 291; the production of fruit brandy was 22,194 gallons; amount of distilled spirits gauged, 727,502 gallons; and output of fermented liquors, 117,488 barrels. During 1899 the textile industries were remarkably active and prosperous. Ten new cotton mills, equipped with the latest type of machinery, were established during the year, and a number of old ones were enlarged or refitted. In Atlanta conditions were such as to warrant a promise of an advance in wages to all operatives on January 1, 1900, and in Dalton the Crown Mill broke the world's record in cotton-mill dividends with a declaration of 83 per cent. in stock and 10 per cent. in cash, against a total dividend of 43 per cent. in 1898. This plant is now being enlarged by the erection of another \$100,000 mill. An interesting new feature of this industry is that cotton factors have established a handsome direct trade with China. See COTTON AND THE COTTON INDUSTRY.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Brunswick, St. Marys, and Savannah aggregated in value \$382,129, and the exports, \$34,470,333, of which Brunswick shipped \$10,421,488 and Savannah \$24,029,572. The total foreign trade was officially \$4,724,552 less than in the previous year. These figures do not give the true amount of the State's foreign trade, for a considerable amount of commodities is delivered in other States and credited to their ports.

Railroads.—In 1898 the new railroad construction amounted to 129.78 miles, and in 1899 to 144.60 miles, giving the State a total mileage of 5687.30, the largest of any Southern State. The corrected assessed valuation of railroad property was \$42,695,508 in 1898 and \$43,933,866 in 1899.

Education.—In July, 1899, Hon. W. B. Hill, of Macon, was elected chancellor of the University of Georgia to succeed Dr. W. B. Boggs, resigned. The Georgia School of Technology, at Atlanta, wove its first piece of cloth on September 22 while the looms were being tested. All the machinery of the textile department was assembled and in running order before the end of the year, and the department was pronounced the best equipped one in the country. At the close of the school year 1897-98 the school population was 744,500; enrolment in public schools, 450,832; and average daily attendance, 278,715. There were 9505 teachers, 6622 buildings used as school-houses, and public school property valued at \$3,977,070. The revenue was \$1,745,200; expenditure, \$1,758,106, of which \$1,515,698 was for teachers' salaries. There were 105 public high schools, with 237 teachers, 5454 secondary students, and 4241 elementary pupils; 67 private secondary schools, with 193 teachers, 3390 secondary students, and 6986 elementary pupils; 2 public normal schools, with 34 teachers and 1060 students in all departments, and 3 private ones, with 25 teachers and 625 students. Eleven colleges and universities for men and for both sexes reported 1 fellowship, 8 scholarships, 135 professors and instructors, 2177 students, 83,410 volumes in the libraries, \$75,450 invested in scientific apparatus, \$1,569,000 in grounds and buildings and \$855,618 in productive funds, \$148,925 in total income, and \$59,750 in benefactions. A like number of colleges for women had together 181 professors and instructors, 1803 students, 23,860 volumes in the libraries, \$17,475 invested in scientific apparatus, \$715,000 in grounds and buildings and \$100,000 in productive funds, \$197,800 in total income, and \$14,000 in benefactions. In 1899 there were 372 periodicals, of which 25 were dailies, 290 weeklies, and 40 monthlies.

Banks.—On October 31, 1899, there were 27 national banks in operation and 17 in liquidation. The active capital aggregated \$3,756,000; circulation, \$1,280,160; deposits, \$8,995,337; and reserve, \$2,565,385. The State banks, September 5, 1899, numbered 136, and had capital, \$9,240,828; deposits, \$21,150,309; and resources, \$37,577,934. The exchanges at the United States clearing houses at Savannah and Atlanta in the year ending September 30, 1899, aggregated \$214,529,972, an increase of \$12,689,624 in a year.

Finances.—The recognized bonded debt October 1, 1899, was \$7,936,000, of which \$4500 was past due and probably lost or destroyed. There were also contingent liabilities, in railroad bonds endorsed by the State, amounting to \$464,000. The State owns the Western and Atlantic Railroad, 138 miles long, and leases it at an annual rental of \$420,012. Assessed valuations in 1899 comprised real estate, \$235,410,751; personal property, \$137,516,326; railroads, \$43,933,866—total, \$416,860,943, an increase in a year of \$5,047,032; and the tax rate was \$5.36 per \$1000.

New Penal System.—The report of the State Prison Commission, submitted to the legislature in October, 1899, congratulates the people of the State on the results of the complete change in the penal system which went into effect in April preceding. The most important feature of the new law is that the old method of leasing convicts indiscriminately, which led to countless evils and protests, is discarded entirely.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 2,240,000.

Legislation.—A commission was created, consisting of the governor, the State treasurer, and the comptroller-general, which is to prepare and issue State bank-notes to State banks to an extent not exceeding 75 per cent. of their paid-up capital, these notes to be a first lien upon the bank's assets, and stockholders to be liable for their redemption to an amount equal to the capital stock owned. A reserve of 25 per cent. of the bank's outstanding notes must be kept on hand in legal tender notes or specie. If the United States government attempts to collect the tax of 10 per cent. upon State bank-notes, provided by the federal law, the attorney-general will test the constitutionality of the federal statute. The action under this interesting piece of legislation will be watched with much interest. A law was enacted that judges shall decide motions and demurrers within thirty days after their submission, and the equity rule was changed so that the answer of defendant as to facts of his own knowledge, responsive to discovery sought, shall be evidence in favor.

State Officers and National Representatives.—Governor, Allen D. Candler; secretary of state, Philip Cook; treasurer, W. J. Speer; comptroller and insurance commissioner, W. A. Wright; adjutant-general, J. M. Kell; attorney-general, J. M. Terrell; superintendent of education, G. R. Glenn; commissioner of agriculture, O. B. Stevens; Supreme Court: Chief justice, Thomas J. Simmons; associate justices, Samuel Lumpkin, Henry T. Lewis, Andrew J. Cobb, William A. Little, William H. Fish; clerk, Z. D. Harrison. The State legislature consists of 209 Democrats, 2 Republicans, and 8 Populists. Senators, Alexander S. Clay, from Marietta, and Augustus O. Bacon, from Macon—both Democrats. Representatives, Rufus E. Lester, from Savannah; James M. Griggs, from Dawson; E. B. Lewis, from Montezuma; W. C. Adamson, from Carrollton; L. F. Livingston, from Kings; Charles L. Bartlett, from Macon; John W. Maddox, from Rome; W. M. Howard, from Lexing-

ton; F. C. Tate, from Jasper; W. H. Fleming, from Augusta; W. G. Brantley, from Brunswick—all Democrats.

GERLACHSTEIN, Count **HOHENWART**, Austrian statesman, was born in 1824 and died at Vienna, April 26, 1899. He was the leader of the Conservative Autonomist party. From February to October in 1871 he was the Austrian premier and minister of the interior.

GERMAN EVANGELICAL SYNOD OF NORTH AMERICA, founded in 1840, is a union of Lutheran and Reformed churches, and in 1899 reported 891 pastors, 1123 churches, and 202,415 communicants, with 956 Sunday-schools, 9939 teachers, and 97,631 scholars. The mission in East India reported 447 baptisms.

GERMAN LITERATURE. History and Biography.—A salient feature of the annual literary output in Germany is the large proportion of historical works bearing upon the history of that country; and of the formidable array of bulky tomes, local annals, records of public archives, monographs, and inaugural dissertations which go to swell the list for 1899, it will be possible here to mention specifically only a very small porportion. Indeed, an important part of the historical material now in course of publication, consisting of series of public documents, such as the *Monumenta Historiæ Germaniæ*, or the *Quellen zur Geschichte der Stadt Wien*, is hardly entitled to be mentioned under the head of literature. Of the publications of the past year, one of the most interesting, both for its historical and its literary merit, is the eighth volume of Felix Dahn's monumental work, *Die Könige der Germanen*. This veteran and prolific writer, who is by turns poet, novelist, and historian, and has for many years been professor of law at the University of Breslau, wrote the first six volumes of his principal work during the years 1861-71. Here it rested for over twenty years, since Vol. VII. was not begun until 1894, while of Vol. VIII., which deals with *The Franks Under the Carolingian Kings*, five parts, comprising upward of 1500 pages, are now ready. An interesting monograph which should properly be mentioned here, as also bearing upon the early history of the Germanic people, is E. Sehmsdorf's *Die Germanen in den Balkenländern bis zum Auftreten der Goten*. Two comprehensive works, dealing with special epochs of the nation's history, are in course of publication: Gustav Wolf's *Deutsche Geschichte im Zeitalter der Gegenreformation*, and K. T. Heigel's *Deutsche Geschichte vom Tode Friedrichs des Grossen bis zur Auflösung des alten Reiches*, the first volume of which covers the period 1786-92, or from the death of Frederick the Great to the campaign in Champagne. Two other volumes which deserve a passing mention are the second part of Von Lettow-Vorbeck's *Geschichte des Krieges von 1866 in Deutschland*, which covers the period of the campaign in Bohemia, and H. Ulmann's *Russisch-preussische Politik unter Alexander I. und Friedrich Wilhelm III. bis 1866*. The second part of W. von Hassell's exhaustive history of the kingdom of Hanover appeared last summer, and includes the events of the years 1849-62. Like the previous volume, it owes its value to the extensive use which the author has made of hitherto unpublished documents. Another interesting local history, in course of publication, is a *Geschichte der Stadt Bremen*, by W. von Bippen, who is making good use of the exceptional opportunities which he enjoys as keeper of the archives of that city. Otto Wiedfeldt contributes a volume of statistical studies on the history of the development of industries in Berlin from 1720 to 1890, which is of considerable value, both historical and economic, since it traces the transition from the industrial system of the middle ages to the methods in vogue to-day. Among the few historical works of the year which deal with other nations than Germany may be singled out for mention the second part of E. Caro's *Genua und die Mächte am Mittelmeer, 1257-1311*; *Das Republicanische Brasilien in Vergangenheit und Gegenwart*, by Oskar Costatt, a bulky volume of nearly 500 pages; a voluminous history of Bohemia, by Adolf Bachmann, in the comprehensive series of *Geschichte der Europäischen Staaten*, which is being edited by A. H. L. Heeren, F. A. Ukert, and others; and an especially timely volume in Dr. Alfred Zimmermann's important work, *Die Europäischen Kolonien*, being the second part of the volume dealing with *The Colonial Policy of Great Britain*, which covers the period from the independence of the United Kingdom down to the present day.

History and biography are pleasantly blended in such works as C. Wölffgruber's *Frans I., Kaiser von Oesterreich*; *Philipp II., August, König von Frankreich*, by A. Cartellieri, the second part of which covers the years 1180-86; and Max Immich's *Papst Innocens XI.*, which professes to be both "a research into the history of his political acts and a characterization of his personality." As might be expected, the Bismarck literature continues this year with little abatement; among the more important of the recent volumes may be mentioned: G. von Wilmowski, *Meine Erinnerungen an Bismarck*, edited by M. von Wilmowski; *Bismarck-Denkwürdigkeiten*, by P. Liman, being a collection of memorabilia, drawn from Bismarck's letters, speeches, etc., and amplified by personal recollections of the author; and

Bismarck 1888-98, by E. von Redern, who devotes upward of three hundred pages to a well-documented account of this significant decade in the life of the Iron Chancellor. To this list should be added a suggestive monograph by R. Bonin, *Luther, Lessing, Bismarck im Werdegang des Deutschen Volkes*. Among other statesmen who in 1899 received notice are Von Humboldt and Kaunitz. The second volume of Gebhardt's *Wilhelm von Humboldt als Staatsmann*, follows the story of Von Humboldt's life down to the time of his retirement from office. A. von Arneth has written the *Biographie des Fürsten Kaunitz*, while the correspondence which passed between Kaunitz and Von Spielmann during the years 1779-92 is edited by H. Schlitter. The present vogue of Cromwell literature seems to have spread to Germany, for she adds one rather heavy volume to the list. It is by S. von Bischoffshausen, and bears the ponderous title, *Die Politik des Protektors Oliver Cromwell in der Auffassung und Thätigkeit seines Ministers des Staatssekretärs John Thurloe*.

As was to be expected, the 150th anniversary of Goethe's birth gave a new impetus to Goethe literature. The limits of space make it impossible to do more than mention the titles of some of the more important of these numerous publications. They include a new volume of *Goethe-Forschungen*, by the well-known Goethe-student, Woldemar von Biedermann; the first part of an ambitious work by Dr. Albert Bielschowsky, *Goethe, sein Leben und seine Werke*, which follows the poet's career as far as his return from Italy; *Goethes Jugendfreund, Friedrich Maximilian Klingar*, by Emil Neubürger; *Goethes Leipziger Studentenjahre*, by J. Vogel, described in the sub-title as "a picture-book for poetry and truth"; *Goethe und Napoleon*, by Andreas Fischer; *Goethes Vater, eine Studie*, by Felicie Ewart; *Goethes Stellung zu Religion und Christenthum*, by Karl Sell. To these should be added a handsome souvenir volume of the poet's 150th anniversary, *Goethe, Eine Biographie in Bildnissen*, which consists of a folio volume of portraits, including 165 illustrations and a photograph of the oil-painting by Stieler, dating from 1828.

Drama.—Nothing is more noticeable, in contemporary German literature, than the almost exclusive cult which the chief writers are now making of the drama, at the expense of both poetry and fiction. Hermann Sudermann and Gerhart Hauptmann, whose pre-eminence among German writers of to-day is not likely to be called in question, have both definitely dedicated their genius to this special literary form; while many promising writers of lesser magnitude, who, like Arthur Schnitzler, owe their first success to the novel, are now tending to abandon fiction for the more alluring prospects which await a successful play. Sudermann, who began with a series of middle-class dramas, such as *Ehre, Heimat, Sodoms Ende*, and *Das Glück im Winkel*, all of them admirable for their convincing realism, followed them up, somewhat more than a year ago, with a work distinguished for its elevated style and wide historic outlook. This was the much-discussed tragedy, *Johannes*, which deals with the story of the forerunner of the Saviour. Sudermann has introduced into the character of the Baptist an element of dramatic conflict, and seeks the motive for his death not merely in the desire of Herodias for vengeance, in accordance with the biblical narrative, but more immediately in the prophet's sudden misdoubt of himself at the crucial moment. Just as his hand is raised to cast a stone at the princely pair and proclaim them unworthy to enter the temple, thus giving the signal for a revolt, the truth of a saying learned from the "carpenter's son," that love is higher than law and sacrifice, is borne in upon him, the stone drops harmless from his hand, and he is unresistingly taken captive by Herod's officers. In *Johannes*, Sudermann has symbolized the victory of faith over doubt; in his latest work, the fairy play, *Die Drei Reiherfedern*, he seeks to depict the opposition between desire and love. It is the endless delusion of desire which drives his young northern hero, Prince Witte, ceaselessly about the world, and when once he attains the object of his longings, it is a part of the tragedy of this delusion that he should never guess that the desire is attained, but should forsake the woman of his longings and continue his wanderings, until released by death. The lack of clearness and scenic effectiveness have caused the new play to be pronounced a failure; yet the more far-sighted critics find in it weightier evidence of the deepening of his art than in many of his pronounced successes. A like evidence of maturing power is to be seen in Hauptmann's great success of last year, *Fuhrmann Henschel*. The events in the play are exceedingly simple and are presented with wonderful clearness and simplicity. Henschel's wife, when dying, exacts a promise that he will not after her death marry the girl who is at this time in their service. Henschel, however, is a simple-minded person, who does what he thinks right without brooding over the matter. He has given his promise and his wife is dead. But his household cannot get along without a woman, his child needs a mother's care, the girl proves herself capable, so he marries her, after all. Destiny, however, pursues him; the new wife deceives him, makes his life a burden, and stirs up strife between him and his friends and neighbors. When at length he learns from his brother-in-law of her infidelity, and confronting her with the charge, finds that she has no

defence, the truth flashes upon him—either he or the wife must die. Suddenly his eye falls upon a piece of whipcord which he fancies he has not seen for years, and interpreting this to be the will of destiny, he hangs himself with it. To evolve from such humble material as is offered by these rude Silesian peasants a drama so full of human interest and so imbued with the relentlessness of fate is an achievement of art which quite dwarfs all the lesser plays of the past year. There are, however, a few young playwrights who deserve a passing word. Two of these are Viennese writers, Arthur Schnitzler and Hugo von Hofmannsthal. Schnitzler's recent work includes one long play, *Das Vermächtnis*, which was a distinct failure and several one-act pieces of genuine merit—among others, *Die Gefährten*, which pictures the husband of a faithless wife, who learns her infidelity on the day of her funeral, and *Der Grüne Kakadu*, a fantastic caprice of the period of the French Revolution. Hofmannsthal's latest efforts are *Hochzeit der Sobiede*, described as a "fairy tragedy in two acts, suffused with all the coloring of the East," and *Abenteurer*, which is redolent of the spirit of eighteenth-century Venice. Both pieces proclaim him a true lyricist, with a passion for warm and brilliant colors. Other plays which attracted attention during the season of 1898-99 are Max Halbe's *Die Heimatlosen*; *Pauline*, by Georg Hirschfeld, and Max Dreyer's *Hans*.

Fiction.—While the present cult of the drama is drawing the best writers more and more from the other literary fields, the production of novels continues unabated; but as a natural consequence, there are few in the annual output of novels which deserve separate mention. Among the few exceptions is a little volume of short stories by Arthur Schnitzler, *Die Frau des Weisen*, which exhibits at its best his special skill in the delicate portrayal of moods. Lou Andreas-Salome is another writer who excels in subtle analysis of character, and especially in the interpretation of her own sex. Her latest volumes are *Fenitschka*, *Eine Ausschweifung*, and *Menschenkinder*. Wilhelm Raabe and Adolf Wilbrandt have each contributed new volumes during the year. *Hastenbeck*, by Raabe, is a story of the Seven Years' War, but the interest of the plot is feeble, and the critics point to it as evidence of failing powers. Wilbrandt's latest volumes are *Der Sänger* and *Vater Robinson*. The problem of higher education for women, which has encountered so much opposition in Germany, has given a theme for a number of striking stories by women during the past year, the most noteworthy of which are *Halbtier*, by Helene Böhlau, and *Wir Frauen Haben kein Vaterland*, by Ilse Frapan. *Halbtier* is distinctly revolutionary in tone, the author taking the ground that in the eyes of German men the German woman is "half a brute." The plot is distinctly unpleasant, the heroine being in constant rebellion against whatever impresses her as inequality between the sexes, and in the end she shoots down her brother-in-law, who has insulted her honor. Ilse Frapan's little volume is a pathetic little story of a young girl's struggle to satisfy her longing for a university education, and how the need of daily bread finally defeated her. Another story by the same author, *Die Betrogenen*, also deals with university life at Zurich; it may be briefly summed up as the relation of an experiment in free love.

The society novel plays a less important part in Germany than formerly. Its chief exponents to-day are Friedrich Spielhagen and I. R. zur Megele. Spielhagen's recent volumes are *Herrin*, which fell distinctly below his former level, and *Opfer*, which is about on the same level. Megele has given us this year another two-volume novel, *Von Zarter Hand*. Paul Lindau's *Agent*, which deals with a criminal case, and Rudolf Stratz's *Mont Blanc*, are both readable stories. Among the numerous historical novels of the year may be mentioned *Die Rächerin*, by Richard Voss, containing four novelettes of Roman times; *Lucius Flavius*, a romance of the last days of Jerusalem, by Joseph Spillmann, a ponderous volume, with copious citations from Josephus; and *Scolastika Bergamin*, by Hans Sittenberger, which the subtitle defines as "Eine Geschichte aus der Frankenzeit," and which one critic pronounced "a work of art and a masterpiece in one."

Other volumes which deserve passing mention are *Die Macht der Stunde*, consisting of short stories by Paul Heyse; *Vollmondzauber*, a mystical romance, by Ossip Schubin; *Roman aus der Dekadance*, by Kurt Martens, which in style is reminiscent of Garborg or d'Annunzio, while the plot suggests Zola's *L'Œuvre*; *Unter dem Katalpenbaum*, by Adolf Hausrath, in which the aged hero of the story goes to sleep under the shadow of the old nut-tree growing upon the "dream-bank" and re-lives in his sleep three separate former existences; *Die Sonne*, by Anton Frhm. vo Perfall, a symbolic novel, the sun being emblematic of the large city, whose fame stretches out like rays over the country and draws all things to it.

GERMAN SOUTHWEST AFRICA is a German protectorate on the west coast of Africa, north of the Orange River; estimated area, 322,450 miles; estimated population, 200,000 in 1897. Its general boundaries are Angola or Portuguese West Africa on the north, British South Africa or Rhodesia-Bechuanaland on the east, Cape Colony on the south, and the Atlantic Ocean on the west. Though cut off

from the interior of the continent by British South Africa, a narrow strip of territory extends eastward along the southern boundary of Angola to the junction of the Chobe and Zambesi rivers, near the Victoria Falls in Rhodesia. Four important rivers touch the territory of Southwest Africa, the Orange River on the southern boundary, the Cubanga, emptying through the Zambesi, and the Cunene entering the Atlantic on the northern boundary, and a river traversing the state and emptying into Walfisch Bay in the middle of the coast line. This bay is by far the best harbor along the 330 miles of coast line, but is possessed by the British, who had obtained the mouth of the river before the Germans acquired the country about. There are several other fair ports, however, including Sandwich Harbor, Lüderitz Bay, and the new harbor of Swakopmund, which is connected by railway with Windhoek. The latter, 180 miles east of Walfisch Bay, on the river, is the seat of government. The government is a protectorate under an imperial commissioner. Although the coast lands of the colony are sterile the interior is fit for cultivation did German enterprise allow its development. When it was first acquired, through purchase, by Herr von Lüderitz in 1883, there was a knowledge that a flourishing trade had formerly been carried on from the interior, among the articles which were brought out for export being ivory, ostrich feathers, gums, skins, and horns, all products of a primitive type, but indicative of a richer country than was generally supposed to lie behind the arid sand-dunes of the coast. Lüderitz died shortly afterward, but explorations in time showed the truth of his claims regarding the richness of the territory. As yet, however, little farming is being carried on, except for pastoral purposes. The chief imports are cotton goods, provisions, and mineral oils. In 1897 they amounted to \$1,187,426, coming from Germany, Cape Colony, and England; the exports are chiefly guano (which goes to England), hides, and ostrich feathers; they amounted in 1897 to only \$303,363, and went to the above-named countries. The northern districts are occupied by the Southwest Africa Company, an Anglo-German syndicate, which has a mining concession from Berlin and operates copper mines at Otavi. There is also the German Southwestern Africa Colonial Company, whose district consists mostly of the coast lands. In November, 1899, by reason of an understanding between the German government and the British South Africa Company, the latter agreed not to complete its railway from the British lands through German territory to the west coast of Africa, south of 14° S. latitude, except from a point on the Anglo-German frontier, to be agreed upon by the German government; and not to construct a road to the coast north of 14° S. latitude until a railway line had first been built through German Southwest Africa south of that degree. There has been a tendency among the Boers of South Africa, for some time, to emigrate into ports of German Southwest Africa, but they have been excluded by the Germans, who do not appear to realize that desirable settlers in the agricultural portions of the colony are among the things most needed at the present time. The Germans apparently fear that the Boers will not adopt German customs, and will become too powerful a foreign element to be submissive members of a German colony. There is little question, however, that they would develop the agricultural possibilities of the country, as shown by their conquest of the territory occupied in the great trek across the Vaal River from the British possessions.

GERMANY, in the north-central part of Europe, including the *Reichsland* of Alsace-Lorraine. The area is 208,830 square miles, and the population, census of 1895, is 52,279,901. Germany has 26 towns of over 100,000 inhabitants. The 7 largest are Berlin, 1,677,304; Hamburg, 625,552; Munich, 407,307; Leipsic, 399,963; Breslau, 373,169; Dresden, 336,440, and Cologne, 321,564. Among foreign nationalities in Germany there are nearly 3,000,000 Poles, who live mostly in eastern Prussia. About 13,500,000 Germans live in Austria-Hungary, Switzerland, and France. About 63 per cent. of the inhabitants are of the Protestant faith and 36 per cent. are Catholics.

Natural Products.—Agriculture is extensively carried on, and supports about 19,000,000 of the population directly. About 90 per cent. of the area of Germany is classed as productive, and includes arable, pasture, and forest lands. The principal crops are rye, hay, oats, potatoes, wheat, and barley; there are also hemp and flax, madder, wool, saffron, tobacco, hops, beet-root, the vine, and a variety of fruits and vegetables. The consumption of agricultural products in Germany is far above the production, so that the imports of this class are large. Germany's mineral resources are extensive, the greater part of the ores coming from the kingdom of Prussia. The principal minerals are coal, lignite, iron, zinc, potassic salts, rock salt, lead, and copper. Forestry is an industry of great importance, and is scientifically supervised and conducted by the state. About one-quarter of the Empire is covered with forests, from which there is a large annual revenue. See AGRICULTURE (paragraph Agricultural Teaching).

Manufactures.—Germany's importance as a manufacturing country is steadily increasing. It is estimated that in 1871 67 per cent. of the population were engaged in

agriculture, while in 1899 the figures were approximately reversed, about 67 per cent. being engaged in manufactures and commerce. In the iron and steel manufactures, Germany is one of the leading nations of the world, and in the manufacture of beet-root sugar it stands at the head of European countries. The chief industries include in addition the mining of coal, the manufacture of coke, machinery, seed oils, potash salts, the linen and woollen industries, and the production of beer. There are also manufactures of glass, porcelain, and earthenware, clocks, and woodenware. It is stated in a recent report on German commerce that, in spite of complaints of increased industrial competition abroad, of the stringency of competitive tariffs, and the growing cost of living at home, there is general prosperity and activity in all fields of German industry. An illustration of manufacturing progress is its recent development of industries in Crefeld, Elberfeld, Berlin, Chemnitz, and Leipsic. Again, the consumption of coal, a fair index of the health of manufacturing and trade, has increased for some years at an annual rate of between two and three million tons. German manufacturers have set up plants in Russia and many Russian industries are under German control. German industrial development during the past twenty years has been marked by a great concentration of capital and the formation of many large syndicates. These concerns have been criticised on similar grounds to those on which the objections to trusts in the United States have been based, but they seem to have had a favorable effect upon Germany's foreign trade, since they have been able, by keeping up home prices, to underbid the competitors in foreign markets. This concentration of capital is especially marked in the electrical industries. During the same period there has been an increase of wages, which, during the last ten years, are said to have risen 20 or 25 per cent., in response to the enhanced demand for labor.

Commerce.—The value of imports into Germany rose from \$1,159,060,000 in 1897 to \$1,296,148,000 in 1898; that of the exports, from \$901,380,000 to \$962,380,000. The principal items of German exports are textiles, metal and metal wares, cartridges, and percussion caps, "articles of consumption," chemicals and drugs, leather goods, machinery, etc. The principal countries receiving German goods in 1898 were, in the order of importance, Great Britain, Austria-Hungary, Russia, the United States, the Netherlands, Switzerland, France, and Belgium. Exports to the United States were considerably affected by the Dingley tariffs. Germany has risen to a rank second to England in commercial importance, and is at the present time putting forth the greatest efforts to increase her export trade. German capital plays an important part all over the world. German enterprises are very large in South America and China (*q. v.*), while in the United States the empire's capital in railroads alone is put down at \$180,000,000, and large amounts have been invested in manufacturing concerns, such as the Liebig company. The opinion has been expressed in the German press that the trip of Prince Henry of Prussia from Vladivostok through the Usuri country to Khabarovsk had some commercial significance. There is already considerable trade rivalry in eastern Siberia, especially between Germany, Belgium, and France. Germany has at present the advantage in trade. There are 82 German ships, aggregating 49,000 tons, heading the list of those plying between Vladivostok and Hong Kong, Shanghai, and Nagasaki. Exports to Denmark, however, suffered a considerable decline in 1899 owing to the expulsion of the Danes from Schleswig-Holstein. (See the article on DENMARK.) Among the causes of the industrial and commercial expansion in Germany may be mentioned the high point to which commercial education has been carried in that country, and the admirable system of technical and industrial education. The imperial government has also done much to promote foreign trade, and the efficient consular and diplomatic service is another factor. No countries have a better system for keeping the home merchants well informed as to the state of foreign markets. Wherever German trade goes there is sure to be an agency for distributing information as to trade conditions. As to the import trade, goods are brought by Germany from Great Britain, Russia, the United States, Austria-Hungary, France, Belgium, the Netherlands, and Switzerland, named in the order of importance. Over \$150,000,000 were spent for food articles alone. The principal imports from the United States show in a measure to what extent Germany is dependent upon this country for cereals, meats, and some of the essential raw materials. These imports, ranged in the order of their value as given in the trade statistics of 1898, are, in round figures, cotton, 191,000,000 marks; corn, 97,300,000 marks; wheat, 84,000,000 marks; lard, etc., 79,800,000 marks; petroleum, 59,700,000 marks, and copper, 56,700,000 marks; also meats, hides and skins, oil cake, lumber, and timber, rye, barley and oats, fresh and dried fruits, resin and turpentine, raw tobacco, machinery, and less important articles, including bicycles, butter, and pig-iron.

Trade with the United States.—The United States is fast building up a trade in Germany in finished industrial products, especially in machinery. The great increase of American imports into Germany is said to be giving manufacturers and producers more concern than almost any other question, owing to the high quality

and in general the lower price of American goods and products and their consequent effective competition in the German home market itself. In regard to the agricultural imports, a recent economic publication which has had a wide circulation in Germany, declares that the competition of this country is more to be feared than that of any European nation, owing to the superior agricultural and commercial methods of the Americans. A tariff sufficient to protect the German farmers is regarded as a necessity. The restrictions placed upon American meat, on account of the alleged presence of tuberculosis germs, is, according to various United States Consular Reports for 1899, due to ignorance of the efficacy of our inspection laws, but in some trade circles of this country it is claimed that these restrictions are really of a retaliatory nature. The inspection of California fruits for the purpose of detecting the presence of the San José scale also affected the importation of this class of goods, but these restrictions were largely removed late in 1899. The imposition of larger tariffs on American industrial goods has been delayed by opposition among retailers and dealers, but it is reported that measures of common defence against American competition is being steadily urged by the various industries in the iron and steel, wire, machinery, bicycle, and similar industries. Already the members of the German bicycle manufacturing association have decided to refuse credit to all dealers who handle American wheels. The 15 per cent. increase of foreign-made machinery in 1897 was mostly due to the increase of American manufactures. In 1897 the latter amounted to 30 per cent. of the English imports. In 1898 they were 60 per cent., a rate of increase which will soon place the United States first as a foreign competitor in the German market. The remarkable industrial development of this country is also threatening German trade in other parts of the world, especially in Japan, China, and Australia.

German Shipping.—It is estimated that while the German foreign trade has increased 60 per cent. during the last twenty-five years, the German merchant marine has more than trebled. According to the latest statistics as to the world's shipping, Germany had in 1899 a total tonnage of 2,465,387, of which nearly 2,000,000 tons represented steam vessels. The vessels of all classes numbered nearly 4000. Germans point with pride to the fact that some of the largest and fastest vessels, for example, the *Kaiser Wilhelm der Grosse*, were built in German ship-yards. In this respect Germany leads, having at least 20 steamships with a tonnage of 10,000 tons and upward, to 9 such vessels for Great Britain. This is said to be due to the stimulus given by mail and other subsidies.

Trade Policy.—In order to maintain the national trade supremacy, German political opinion will, no doubt, soon settle or compromise upon one of the three main questions of foreign trade policies which have been advanced. The first, held by the Agrarians, favors the establishment of a more strict protective policy in regard to meats and cereals, and would put an end to the concessions granted by commercial treaties. The second, held by the industrial group, favors the lowering or abolition of the duties upon foreign meats and breadstuffs, in order to lower the cost of production in manufactures. The third, held by the commercial group, such as the dealers and retailers, advocates free trade and the extension in every possible way of foreign commerce.

Colonies.—All of Germany's colonies have been secured to her since 1884, and embrace in the aggregate an area of considerably over 1,000,000 square miles, with a population approximated at 10,000,000. Several additional groups of dependencies, made up of islands in the Pacific, were added to her possessions in 1899. The most important of her colonies are in Africa, and include Togoland and Cameroon, on the Gulf of Guinea; German Southwest Africa, farther down the coast, and German East Africa, on the eastern coast. In 1899, by a convention between Great Britain and Germany, the neutral zone in the hinterland of Togoland and the British Gold Coast was divided anew, the greater part falling to Great Britain as a compensation for her relinquishment of control in Samoa. By the same treaty and for similar reasons Germany ceded to England the Tonga Islands, lying to the south of Samoa, including the Vavau and Savage Island groups, and also the islands of Choiseul and Isabella in the Solomon group. The ending of tripartite control in Samoa by Germany, Great Britain, and the United States resulted, upon the retirement of England, in the acquisition by Germany of the islands of Savaii and Upolu, while the United States received the important island Tutuila. Besides these islands, Germany added to her colonial possessions by purchase from Spain the Caroline, Pelew, and Ladrone, or Marianne, groups in the Pacific. In the latter archipelago the island of Guam, having been acquired by the United States in the Spanish-American war of 1898, was excepted in the German purchase. The other German dependencies in the Pacific are the Bismarck archipelago, Kaiser Wilhelm's Land, on the island of New Guinea, or Papua, the Marshall islands, and the remainder of the Solomon group. Finally there is the recent acquisition of the Chinese harbor of Kiaochow, with certain rights over the adjacent territory. The acquisition of

the island territories is a step in line with the German Emperor's policy of providing stations for the growing German navy and for the benefit of the empire's extensive foreign trade. The government has recently given special attention to its large and important African possessions, and is encouraging their development as a source of supply for the mother country.

Railways, Waterways, etc.—The canalization of the country is being steadily carried forward on a large scale. Besides 5831 miles of navigable rivers, there are at the present time about 1400 miles of improved river-ways and a still greater length of artificial waterways. On August 11, 1899, the Dortmund-Ems Canal was formally opened by the German Emperor. This canal, about 150 miles in length, starts at Emden, on the North Sea, utilizes the river Ems for a part of its length, passes through Münster, and terminates for the present at the village of Herne, in Westphalia, Dortmund being connected at Henrichenburg by a 9-mile branch. The canal will accommodate vessels of 600 to 700 tons burden, and is expected to give a considerable impetus to the industries of this part of Germany. It is the government's purpose to make Emden a first-class naval port, to deepen the river-bed, and build naval dry docks and ship-yards. It is expected that the Elbe-Trave Canal will be completed in 1900. The construction of the Rhine-Elbe Canal was strongly urged by the Emperor, but the bill providing for it was on August 17, 1899, rejected by the lower house of the Prussian diet. (See paragraphs on History.) Another ship-canal was recently proposed to connect Leipsic with Reisa, the grain centre of Saxony. The cost was estimated at \$12,000,000, including connection with the Pleisse, and improvements of the harbor in Leipsic, the length being 42 miles. The Main-Danube, the Rhine-Rhone, the Rhine-Marne, and many other canals, ramify through the country, and connect with foreign waterways.

The railways of Germany are owned mostly by the imperial or state governments, and had a mileage in 1896-97 of 29,461; the aggregate length of telegraph lines at the same period was 85,243.

Finance.—The main sources of revenue for the empire are customs and excise duties, federal contributions, and the posts, telegraphs, and state railways. The budget estimates for 1898-99 were, for revenue, 1,412,886,000 marks, and for expenditure, 1,441,579,000 marks. Of the above estimated revenue, 762,332,000 marks were raised by customs, excise, and stamps. The federal contributions are levied according to the population at a certain rate, fixed each year in the imperial budget. The public debt in 1898 was equivalent to £113,063,000. The monetary unit is the mark, which is equivalent to \$0.238 United States. The monetary system is gold monometallism.

Navy.—According to the uniform classification of the 1899 publication of the United States Navy Department on naval progress abroad, the German navy consisted, as reported in July, 1898, of 9 battle-ships, and 5 building; 3 armored cruisers, and 2 building; 7 protected cruisers, and 8 building; 21 unprotected cruisers, 19 coast-defence ships, 2 torpedo vessels, 1 torpedo-boat destroyer in course of construction, 113 torpedo boats, and 9 building, and 1 ship for special purposes. The new naval programme begun in 1898 was the result of the extraordinary efforts of the Emperor. Under it the strength of the fleet will be reached by 1903. In 1899 there were 4 large and 13 small vessels laid down with a tonnage of 51,324. The number of vessels under construction during the year were 19 large and 19 small vessels, with a tonnage of 148,235. There were launched 1 battle-ship, 1 cruiser, 1 gunboat, and 1 torpedo-boat destroyer.

Army.—The army reorganization was completed early in 1898, up to which time the peace-footing, by the law of August 31, 1893, had been 479,229 men, and a slight increase was made. In March, 1899, by a new army bill, the peace-footing was increased by about 16,000 non-commissioned officers and men, some 7000 less than proposed by the government. The full strength will be attained by 1903. The mobilized strength of the army is, according to estimates made in 1898, nearly 4,000,000 men.

Emigration.—According to the report of the United States commissioner-general of immigration, there came to this country in 1898-99, 26,632 German immigrants, of which number 17,476 came direct from Germany. The latter figure shows an increase of 365 over the number emigrating from Germany to the United States in the preceding year. By far the larger part of German emigrants have come to the United States, but the number of all emigrants is annually decreasing. In 1881 it was 210,547; in 1887, 99,712; and it has declined rapidly within the last decade, dropping off 50 per cent. within the past three years.

HISTORY.

The Lippe-Detmold Affair.—The question of the Lippe-Detmold succession has been pending since 1897. At the beginning of 1899 it was still an important subject of discussion. The Prince of Lippe-Detmold being incapable of ruling, a regency had been established and two claimants had appeared—namely, Count Ernest of

Lippe-Biesterfeld and the reigning Prince of Schaumburg-Lippe. The King of Saxony, who had been chosen as arbitrator, declared in favor of Count Ernest as regent, whose right was recognized by the rival claimant. The question now arose whether the regent could transmit the throne to his children. This was denied by the Prince of Schaumburg-Lippe. The diet of Lippe-Detmold had declared the children of Count Ernest the legitimate successors. Appeal was taken to the federal council, which rendered a preliminary decision of importance on January 5. The council declared itself competent in the matter, although it refused the request of Schaumburg-Lippe to prevent the Lippe-Detmold legislature from regulating the succession. There was much difference of opinion as to the right of the federal council to interfere when a question of succession arose in one of the states. Such interference was opposed by both Liberals and Federalists, the former on the ground that it was an invasion of the rights of citizens, and the latter that it intrenched upon the authority of the states. Appeal was made to the *Reichstag*, but the imperial government defended the action of the federal council.

Colonial Expansion.—By a treaty with Spain, dated February 12, and ratified by both governments in June, Germany acquired the three Pacific archipelagoes of the Carolines, Ladrões or Mariannes, and Pelews, all that remained of Spain's colonial empire in that part of the world. The purchase price was 25,000,000 pesetas (about \$5,000,000). Spain reserved the right to a coaling station in each group, and certain of her interests in the islands were safeguarded. The price paid by Germany was regarded by some as excessive, but seemed on the whole a good bargain, since while the islands have little value in themselves, their situation was such as greatly to strengthen Germany's position in the Far East—a matter of importance in view of Germany's aspirations in China. Another important acquisition in 1899 was that of the greater part of the Samoan group (see SAMOA). It was estimated that Germany would spend about \$8,000,000 for her colonies in 1899, and, in spite of the enthusiasm which the policy of colonial expansion aroused in some quarters, it was not generally received with marks of favor. The purchase of the Carolines seemed to be regarded with indifference, and there was some disappointment in connection with Kiaochow, which, though reputed one of the most healthful stations in the East, was found to be exceedingly unhealthful to the German colonists.

Expulsion of Aliens.—The irritating policy of Prussia, noted in the last Year Book, in expelling aliens from Silesia, Westphalia, and Schleswig-Holstein, aroused bitter criticism not only in foreign countries, but at home. The Danes, who were expelled in large numbers, were admitted by the authorities to be inoffensive members of the lower classes, but their removal was justified on the ground that their employers were trying to strengthen the Danish influence in certain districts. The too severe comments upon this policy which Professor Hans Delbrück (*q. v.*), the historian, ventured to make, resulted in a reprimand and the imposition of a fine. The minister of education demanded the transfer of Professor Delbrück to another Prussian university, and on March 25, 1899, he was reprimanded and fined 500 marks.

Measures Before the Reichstag.—The most important matters discussed by the *Reichstag* were the army bill, the bill for the renewal of the Imperial Bank charter, and the anti-strike bill. The army bill came near causing a political crisis. It provided for the progressive increase of the peace effective until in the course of the fiscal year 1902 it should reach a total of 502,506 men, and it also made certain changes in the disposition of the existing forces. The *Reichstag* showed a determined opposition to the increase of the effective, and was willing to grant only 495,500 men, which number should be reached in the year 1903 instead of 1902. A compromise was effected on March 16, but with the understanding that if the grant should prove inadequate the government should be free to make new proposals before the expiration of the five-year period. Thus, in 1903 the German army will have attained a peace effective of 495,500 men. The law extending the privileges of the Imperial Bank for twenty years was passed on April 28. Under this law the Imperial Bank obtains the power to determine the discount rates of private banks of issue. The anti-strike bill came up for discussion in the *Reichstag* on June 19. In his speech on the subject of this proposed law in 1898, the Emperor had represented it as being more severe than it really was. It was designed to punish the promoters of strikes. In its original form it did not impose a penalty upon all such agitators, but only upon those who instigated a strike that compromised the safety of the empire or one of the German states, or jeopardized life and property. It provided that whoever tried by force, threats, outrages, or bribes to involve employers or workmen in any understanding for the purpose of making a change in labor or wages should be liable to fine or imprisonment, and the same penalty was to be imposed upon any one convicted of using these means to cause the dismissal of workmen or the abandonment of work in order to cause a lockout or strike. The general purpose of the measure seemed to be to protect workmen against employers



WILLIAM II., GERMAN EMPEROR AND KING OF PRUSSIA.

From a portrait published by the Berlin Photographic Company, New York.

as well as employers against workingmen. Both Liberals and Social Democrats opposed it, the latter nicknaming it the "Penal Servitude Bill." It passed its first reading, but finally was rejected, the *Reichstag* refusing even to send it to a committee (November 20).

The Canal Project.—The most serious parliamentary conflict of the year occurred in the Prussian *Landtag* in August in regard to the government's canal project. This was to connect the Elbe with the Rhine by a canal. There was already the canal from Dortmund to the Ems, which was formally opened in August by the Emperor in person. It runs from north to south and establishes by means of the river Ems communication between Dortmund and the sea. The proposed canal was to consist of two parts, the first running from the Rhine to Dortmund and forming a right angle with the Dortmund-Ems Canal; the second, which was much more important, was known as the centre canal (*Mittellandkanal*), and was to start from the Dortmund-Ems Canal a little to the north of Dortmund and run in an easterly direction until it met the Elbe. Thus the two great rivers of Germany would be united, and since there is already a system of canals east of the Elbe, the result would be a complete network of water communication throughout the empire. It would greatly cheapen transportation from the coal and iron districts of Westphalia to the industrial centres of the Rhine and Elbe. This was a favorite project of the Emperor, who, while reactionary in many of his ideas, has always shown himself progressive in matters of commerce and material welfare. But it encountered violent opposition from the first. It was essentially a measure for commercial and industrial improvement, and as such became an object of suspicion to the Agrarians and Conservatives. They considered their own interest endangered. Besides this, the Silesian members were against it, since they thought the coal-beds of Silesia would suffer from the competition of the Rhine and Westphalia if the canal were carried through. The opposition consisted of the Conservative Right and a part of the Catholic Centre, while the Liberal Left and some of the Catholics supported it. Other members offered their support only at the price of certain concessions on the part of the government. The *Landtag* appointed a committee to consider the bill, and after an investigation this committee reported against it. In the course of his speech at the opening of the Dortmund-Ems Canal the Emperor declared that he would leave nothing undone to secure the adoption of this measure. After a lively discussion in the *Landtag* the bill for the branch connecting Dortmund with the Rhine was lost by a vote of 212 against 209, and the centre canal was lost by a vote of 228 against 126. It was still hoped that on the third reading a compromise might be reached whereby the government would secure the passage of one branch and leave the pressing of the other portion of the measure to a more convenient time. But the Liberals did not favor this and preferred to vote against both parts rather than to accept so small a portion of it. Accordingly, on the third reading, the project for the Dortmund-Rhine Canal was lost by a vote of 275 to 134, and that for the centre canal by a vote of 235 against 147. Before the final vote Prince Hohenlohe had declared, in his capacity as president of the Prussian ministry, that the government would not renounce its project, but would bring it up in another session, and would then find means to cause its adoption. This affair occasioned much discussion, since it showed an opposition to the Emperor on the part of the very political parties upon which he was accustomed to rely in the *Landtag*. The defeat of the government was followed by some reprisals. The defeat was attributed in part to the half-hearted support or the secret opposition of certain official members of the *Landtag*. Some of these functionaries were placed on the retired list, the Conservatives fell into disfavor, and the ministers of public instruction and the interior were replaced. Herr von Miquel, minister of finances, was not disturbed, although it was commonly reported that he had intrigued secretly for the failure of the government's project. The Emperor's defeats on the anti-strike bill and the canal project were most humiliating, and the latter was regarded as especially significant, since it marked a rupture, for a time at least, with the Conservatives, or aristocratic landowners, who were his traditional supporters and the only party that looked with favor on his peculiar ideas of monarchic rule. These ideas had been expressed by the Emperor with renewed emphasis early in the year. In a speech at the banquet of the provincial diet of Brandenburg, on February 3, he referred to the services rendered by his house to Germany, and said the chief thing that made these services so brilliant was the fact that the members of his house had perceived that they were personally responsible to their ruler in heaven. He also referred somewhat vaguely to enemies of his imperial house, and implied his intention to deal with them severely.

Foreign Relations.—The unfavorable comments in the German press on the United States during the Spanish-American war had caused some bitterness of feeling in the latter country, and at the close of the war it was rumored that the German government had designs on the Philippines. In view of the bad effect which these

rumors had in the United States, the Berlin government found it expedient to make a public declaration in regard to the matter. Secretary of State von Bülow, replying to an interpellation in the *Reichstag*, on February 11, declared that the rumor of German designs on the Philippines was utterly false, and, again, on February 28, referred in his speech before the budget commission to the importance of maintaining friendly relations with the United States. As to The Hague conference, the Germans were not sanguine, and it is probable that the Emperor expressed the general sentiment when he declared that while the peace project of the Czar was a magnificent undertaking, those who counted on it would be disappointed of its success so long as original sin continued among mankind. The general relations of Germany with foreign countries were friendly throughout the year. The Emperor's visit to Great Britain (*q. v.*) and his interchange of courtesies with the French (see FRANCE) were construed as marking closer relations with each of these powers. On November 4, a German embassy, presided over by Prince Albert of Prussia, arrived at Madrid for the purpose of bestowing the Order of the Black Eagle upon the young king, Alphonso XIII. On November 20 the Czar visited the Emperor of Germany, having gone to Darmstadt to visit his wife's parents. Much political speculation was occasioned by these international courtesies, and their significance was greatly exaggerated in the press. On March 11, Mr. Cecil Rhodes obtained an audience from the Emperor in regard to the railway and telegraph line from the Cape to Cairo, and it was soon afterward announced that a treaty, permitting the running of the telegraph line through German territory had been signed. There was no official notice of any agreement as to the railway project. Important international arrangements in which Germany took part were the settlement of the Samoan question, whereby Germany secured the larger part of the group and Great Britain renounced her rights to any portion of the islands (see SAMOA), and the delimitation convention with Great Britain in respect to the hinterland of the Gold Coast and Togoland (*qq. v.*). Toward the close of the year the German press comments on the war in South Africa showed great bitterness and hostility toward England, but this had no effect upon the official relations between the two powers.

The New Civil Code.—The work of preparing a new German civil code, which was begun in 1874, has been completed, and the new system becomes effective on January 1, 1900. The new code is based largely on national law and is only in part of Roman origin. It has been compiled chiefly from provincial legal systems, especially from those of Prussia and Saxony. Thus, the long conflict between the Roman law of the empire and the native law of the German states has ended with the triumph of the latter. The scientific perfection of the Roman system appealed strongly to the jurists of the sixteenth and seventeenth centuries. During the next two centuries, however, the native law gained ground and native codes supplanted the Latin code of Rome in several of the states. At the same time the study of the *Corpus Juris Civilis* continued, and during the nineteenth century was productive of important scientific results. Thus, the actual practice was divorced from the scientific theory, since the native codes were local in their application and did not reflect the intellectual life of the nation as a whole. The formation of the German Empire in 1871 opened the way to the compilation of a single national code. This new code has been described as reflecting fully the modern spirit. The paramount importance of commercial interests is recognized by this code, which regulates all matters of exchange. The merchants of Germany have long demanded an imperial code, since in all their relations it was essential that a uniform system of commercial law should be employed. A recent writer says: "Briefly speaking, therefore, the new code embodies the rights of the individual and governs the financial relations throughout the empire. Such is its content; hence, its thoroughly mercantile spirit. . . . Not the farmer nor the nobleman is considered; only the legally eligible subject, the abstract unit of the *jus gentium* being here in evidence. This unit or person appears in but one capacity—either as creditor or as debtor; and this conception may be truly said to embody the highest ideal of the merchant." The code guarantees the liberty of the individual and recognizes his right to dispose of property and incur indebtedness. It does not recognize any forms of ownership that are not absolutely free. One of the characteristic features of the code is the protection which it accords to the *bona fide* possessor of property. The *bona fide* purchaser is insured in possession even when the seller was not the actual owner. In fact, throughout the code it is the *bona fide* third person whose rights are always regarded. The code institutes a system of real estate records which shall be at all times accessible to public examination. Claims not registered in this record are invalid, and those which are so registered are recognized as legitimate. Any one who purchases from a person whose name is registered in the record is legally entitled to the property, whether or not the name inscribed is that of the real owner. Thus, the matter of technical justice is ignored in favor of the *bona fide* third party.

Another instance is the law governing the right of inheritance. A so-called certificate of inheritance is given to the adjudged heir to an estate, and any one purchasing *bona fide* from the person named in this certificate is protected in his purchase, whether or not the person there named is the actual heir. Again, the *bona fide* holder of negotiable paper acquires the right to it in all cases without regard to the will of the debtor, but only to the form itself. For example, a hundred-mark note stolen and put in circulation by the thief is valid so soon as it falls into the hands of a *bona fide* third party. In these and other cases it is apparent that the interests of exchange are always regarded. The aim is always to facilitate exchange.

This applies to transactions indirectly involving the liability of the debtor. In the other class of transactions—namely, those which directly involve the liability of the debtor—the law is based on an entirely opposite principle. This is the principle of faith and belief. The chief object in view is the protection of the debtor, who is to be required to pay nothing beyond what is deemed necessary and reasonable. In all contracts of this kind exceptional authority is given to the court, which is not bound by the express wording of the contract, but whose decision is superior both to the letter of the law and the express terms of the contract. The aim is not to secure abstract literal justice, but to apply the principles of equity to the case. If a judge finds that the contract contains unreasonable terms, he may pronounce it invalid. If the penalty imposed for a breach of contract seems to him excessive, he has the right to reduce it. In the case of contracts which involve the exploitation of another person, or show an intention of taking advantage of another's necessity, the court may declare their terms null and void. A complete safeguard against usury is here provided. The civil code is supplemented by the law regulating its introduction, which provides that the existing imperial laws affecting private rights shall not be impaired by the provisions of the code. Many of the provincial laws continue in force. These are agrarian in character.

Other Events.—Among the important acts of legislation during the year was the revision of the law of insurance for workmen. This widened the scope of the law, increased the pensions, and introduced the principle of voluntary insurance for certain classes of workmen. Trade laws were reformed in order to improve the condition of employees in large stores. One of the most significant features of the political history of the year was the new spirit which showed itself in the Social Democratic party, which appeared to be veering toward a Radical or Liberal position in politics and away from the doctrinaire attitude of the strict disciples of Karl Marx. (See SOCIALISM.) The party was strengthened by the departure of the government from its policy of singling out the Social Democrats for especial repression. Chancellor Hohenlohe promised the repeal of the old law, which had been revived against the Social Democrats, and which prohibited their forming political organizations such as were freely admitted in the case of the other parties. There was considerable progress in higher education during the year. Polytechnic institutions were established at Jena and Dantzig. But the government showed an irritating tendency to interfere with university instruction on what seemed to many frivolous grounds. Besides the case of Professor Delbrück, noted above, another instructor was suspended because he was a Social Democrat, and still another was reprimanded at the instance of the Emperor for parodying for political purposes a verse of the Book of Job. The woman's movement for the improvement of women's opportunities for the higher and technical education made some progress. In January the government announced that departments of dentistry, pharmacy, and medicine should be opened to women. At the University of Giessen women were admitted to courses in philosophy and law, and in the University of Strasburg they were admitted as hearers. The movement for establishing *gymnasien* for girls was carried on with success, and several of these institutions were established. The one hundred and fiftieth anniversary of Goethe's birth was celebrated throughout Germany on August 25, but chiefly at his birthplace, Frankfurt, and at Weimar, where he died. See the article GERMAN LITERATURE.

GIRLS' FRIENDLY SOCIETY IN AMERICA, founded in England in 1875, has extended to all English-speaking countries, and numbering in 1899 in all parts of the world 300,000 members, is a society of young church women and girls, which aims to encourage purity, dutifulness to parents, faithfulness to employers, and thrift. There are two classes of members—associates, who must be communicants of the Protestant Episcopal Church, and members, who may be of any denomination. The society was started in the United States in 1877, and had in 1899 a membership of nearly 22,000. The American society publishes the *Girls' Friendly Magazine*. President, Mrs. Thomas Roberts, Philadelphia, Penn.; secretary, Miss Eve Alexander, 659 West Lexington Street, Baltimore, Md. Central office, 281 Fourth Avenue, New York City.

GLACIAL GEOLOGY. Recent studies in the glacial geology of the driftless area of Wisconsin indicate that, after all, there was some glacial action in that region. W. Upham believes that most of the glacial drift of Illinois, Kansas, and a portion of Minnesota is of englacial origin. The existence of a glacial period in recent times has been doubted by few; it has been more difficult though to prove glaciation in earlier periods of the earth's history. Molengraf states that the Gwyka conglomerate of the South African Republic is of glacial origin, and considers that glaciation prevailed over a very large area, probably during a part of the Permian period, while C. H. Hitchcock has come to the conclusion that glaciers existed in many portions of Australasia during the Triassic period.

GLACIERS. The third annual report of the International Committee on Glaciers shows the following conditions: Swiss glaciers: retreating; Eastern Alps: some retreating, some advancing, others stationary; Scandinavian Alps: some stationary, others retreating; Caucasus: retreating; Turkestan: of the twenty-six glaciers lately discovered in the Talass mountain chain, the majority show a most rapid condition of retreat; the same is true on the chain of Peter the Great. In recent years five glacial centres have been discovered in the Altai Mountains. All are rapidly retreating. The inland ice of Greenland seems to be at a maximum, especially in the North. Several small glaciers still exist on the Wenatchee Mountains in Washington, while on the Cascade Mountains, within the United States, there are several hundred small glaciers. The glacier on Mount Iztaccihuatl, in Mexico, is advancing.

GOEBEL, WILLIAM, who became so conspicuous a figure in Kentucky politics as Democratic claimant for governor in the fall of 1899, was born in Sullivan County, Penn., in 1856, and went with his parents to Covington, Ky., when a boy. He was sent to Cincinnati to learn the jewelry trade, but abandoned this to enter the law office of Stevenson and Meyers in 1873. He became law partner of Governor John W. Stevenson and later of John G. Carlisle, and for many years was a prominent member of Democratic State conventions. His advent into politics was made as candidate for State senator to fill the unexpired term of J. W. Bryan, elected lieutenant-governor in 1887, and after that date Goebel represented Kenton County in the Kentucky legislature. Several years ago he shot and killed Colonel John D. Sandford; he was acquitted on the ground of self-defence. Mr. Goebel was the author of the election law recently passed by the legislature and still in force depriving county judges of their power to appoint election officials, and creating a board of three State commissioners (not necessarily from different parties), who appoint subordinate boards in the various counties. Also on the subordinate boards there is no requirement for minority representation. The unfairness of this measure, representative, it was alleged, of many of Goebel's political acts, operated against him in the exciting and bitterly contested campaign that followed. On the face of the returns, as reported, the Republican candidate, W. S. Taylor, was elected by a small majority, and on December 9 he was given the certificate of election. This decision, however, was not acquiesced in by the Goebel Democrats, and the matter was not definitely settled at the close of the year. See KENTUCKY.

GOLD. The following is the production of gold in 1898 as estimated by the director of the mint:

State or Territory.	GOLD.		State or Territory.	GOLD.	
	Fine ounces.	Value.		Fine ounces.	Value.
Alabama.....	242	\$5,000	New Mexico.....	26,074	\$539,000
Alaska.....	122,187	2,524,800	North Carolina.....	4,064	84,000
Arizona.....	119,349	2,465,100	Oregon.....	56,966	1,177,600
California.....	756,483	15,637,900	South Carolina.....	5,041	104,800
Colorado.....	1,122,073	23,195,800	South Dakota.....	275,723	5,692,700
Georgia.....	6,221	128,600	Tennessee.....	48	900
Idaho.....	83,065	1,716,900	Texas.....	14	300
Iowa.....	5	100	Utah.....	110,556	2,235,400
Maryland.....	29	600	Virginia.....	218	4,500
Michigan.....	5	100	Washington.....	37,065	776,200
Minnesota.....	5	100	Wyoming.....	297	5,300
Montana.....	248,014	5,126,900	Total.....	3,118,398	\$64,463,000
Nevada.....	144,859	2,994,500			

Gold production in foreign countries in 1898 and 1899 is reported as follows, the figures representing ounces:

Country.	1898.	1899.	Country.	1898.	1899.
New South Wales.....	341,372	409,100	New Zealand.....	280,176	323,232
Victoria.....	887,357	681,865	India.....	415,147	803,412
West Australia.....	1,050,179	1,339,046	British Guiana.....	113,079	91,278
Queensland.....	918,100	758,700	Transvaal.....	4,555,099	4,121,348
Tasmania.....	48,913	57,402	Rhodesia.....	24,561	55,343

A new gold region is reported—the Cape Nome area on the northern coast of Alaska. The excitement that has existed from time to time over the reported discoveries of gold in northwestern Illinois have led to an investigation with the results that while gold does occur there, still it is not at all in commercial quantities. Dunn describes the gold fields of eastern Siberia in the *Engineering and Mining Journal*, and *The Geology of the Coolgardie Gold Field* was issued by the West Australia Geological Survey. O. H. Hershey discusses the age and origin of certain gold deposits on the Isthmus of Panama. Other books are: J. E. Woodman, *Studies in the Gold-Bearing States of Nova Scotia*, Boston Society of Natural History, XXVIII., and W. B. Begeer, *The Metallurgy of Gold on the Rand*. A new process of gold extraction consists in the use of permanganate of potash as the active or exciting agent in the necessary chemical reactions, while chlorine serves as the solvent. The process is not yet beyond the experimental stage, and possesses some drawbacks. Von Gernet shows the loss of gold in solution from the mills in the South African district.

GOLD COAST, a British West African colony on the Gulf of Guinea, with a coast-line of 350 miles and an area of about 15,000 square miles for the settlement proper and about 46,600 square miles including the protectorate. Population, about 1,500,000, of which only 150 are Europeans; chief towns, Accra, 16,267 inhabitants; Elmina, 10,530; Cape Coast Castle, 11,614. The colony was founded by a chartered company, was transferred to the crown in 1821, became a separate colony in 1874, and included in its sphere of influence in 1895-96 the protectorate Ashanti, whose king made a formal submission to Great Britain as the result of an expedition against the capital Kumasi. The hinterland of the Gold Coast was involved in the Franco-British controversy, which in 1897-98 affected much of that part of Africa, and which is fully treated under Niger Territories (*q. v.*). The resources of the colony, though considerable, have been little developed on account of lack of communication and an unhealthy climate. According to the British colonial report of 1898, there has been a recent increase of trade. The cultivation of cocoa and coffee is on the increase, and the gold-mining industry, in which there are good prospects, is expected to receive an impetus by the completion of a government railway, now building from Secondi, on the coast, to the mining districts in the neighborhood of Tarquah. At the present time it is very difficult to transport the necessary machinery inland to the mines. A railroad has recently been completed from Accra to Kumasi by way of Insuaim, and another from Takoradi Bay to Tarquah. Roads also have been constructed from the chief coast centres to many points of the interior, and are expected to play almost as important a part as the railways in the development of the country. The total imports of the Gold Coast in 1897 amounted to \$3,816,251, and included dry goods, clothing, spirits, provisions, tobacco, and building materials. The exports were valued at \$4,174,450, and comprised gold-dust, rubber, palm oil and kernels, timber, coffee, cocoa, monkey skins, and cola nuts. The increase in the total trade over 1896 was \$349,512. The greater part of the trade is with Great Britain.

GOLDEN GATE PARK MUSEUM. See ANTHROPOLOGY IN AMERICA.

GOLF. Two important advances in the American game of golf resulted from the annual meeting of the United States Golf Association. These were, first, a sensible adjustment of the questions affecting the amateur and the framing of more stringent rules defining his status, and second, a broadening of the scope of the association by a recognition of sectional divisions and championships. In pursuance of the second idea there have been voluntarily established the Metropolitan Association, the Connecticut League of Golf Clubs, the Pittsburg League, the Associated Golf Clubs of Chicago, the Central New York Golf League, and the Western Golf Association. The principal tournaments of the year were as usual the amateur championship, Chicago, July 3-8; the open championship, Baltimore, September 14-15; the women's championship, Bala, near Philadelphia, October 10-14, and the intercollegiate championship, Garden City links, L. I., October 24-28. The amateur championship was won by H. M. Harriman, 3 up, 2 to play, who defeated last year's champion, Findlay S. Douglas, in the final round. Harriman's play was in general brilliant, and his

success emphasized the widespread rise of the native-bred player during 1899. There were 112 entrants. The fifth annual open championship, with 79 entrants, was won by William Smith, of Chicago, with a total of 315 for the 72 holes. Among the final 8 competitors were all the previous champions—Dunn, Rawlins, Foulis, Lloyd, and Herd, and also H. M. Harriman. The women's championship furnished one of the surprises of the season. Seventy-nine entrants played over an 18-hole course of 5420 yards. Miss Beatrix Hoyt, three times champion, lost to Mrs. Caleb Fox in the qualifying round, and Mrs. Fox lost to Miss Ruth Underhill in the final round, the latter having 2 up, 1 to play. The long drive was won by Miss Marion Oliver, Albany, with a drive of 164 ft. 8 in. In the fourth intercollegiate championships Harvard won as follows: Princeton beat Yale 11-7, Harvard beat Columbia 29-0, Harvard beat Princeton 21-2. In the individuals Charles Hitchcock, Jr., Yale, made 80 as the best score in the qualifying round, which makes a competitive record. The individual intercollegiate championship was won by Percy R. Pyne, Princeton, who defeated J. G. Averill, Harvard, by 1 up in a 37-hole match. Pennsylvania was admitted to membership in the Association, and will play in the next championships. The growth of golf and of country clubs continued throughout the country in 1899, a marked tendency being the development of winter golf in the South, especially in Florida, and on the Pacific coast. More public links were laid out also in city parks. At Princeton the importance of golf was recognized by the awarding of the 'varsity letter to Percy R. Pyne. The importance of the game was similarly recognized at Yale in 1898.

GOOD TEMPLARS, INDEPENDENT ORDER OF, originated in central New York, in 1851, and in 1859 adopted a platform declaring for total abstinence, no license, and absolute prohibition. The International Supreme Lodge held its thirty-ninth session in Toronto, Can., June 27-July 4, 1899. The reports showed that there were 81 grand lodges and 37 subordinate lodges in the world, with a membership of 403,287, besides a juvenile branch membership of 172,839. R. W. G. Templar, Joseph Malins, Birmingham, England; R. W. G. secretary, B. F. Parker, Milwaukee, Wis.

GORDON, Sir CHARLES ALEXANDER, K.C.B., M.D., surgeon-general in the British army, retired, was born in 1821 and died September 30, 1899. After entering the army he served with the Sixteenth Lancers in the Gwalior campaign, at the battle of Maharajpore, and in the expedition to the west coast of Africa against Apollonia in 1847-48, having become a surgeon in 1846. He took part in the Indian mutiny campaign in 1857-58, and received the decoration of C.B. and other honors for his services at the siege and capture of Lucknow. In 1860 he became deputy surgeon-general, participated in the China expedition, and from 1862 to 1867 was the principal medical officer of the British forces in the Calcutta and Benares commands. Having been sent in 1870 as a medical commissioner to the French army, he was in Paris during the siege and bombardment of that city by the Prussians. In 1874 Dr. Gordon became surgeon-general, and for the next five years served in the Madras presidency. In 1876 he was made honorary physician to the Queen. He received a special reward for his military services, and was retired in 1880, and in 1897 was created a K.C.B. The following are among his publications: *Army Hygiene*; *Army Surgeons and Their Works*; *China from a Medical Point of View*; *Experiences of an Army Surgeon*; *The French and British Soldier*; *Hygiene and Surgery of the Franco-Prussian War*; *the Soldier's Handbook of Sanitation*; *Life on the Gold Coast*; *The Island of Madaira*; *Our Trip to Burmah*; *Recollections of Thirty-nine Years in the Army*, 1898.

GORMAN, ARTHUR PUE, Democratic United States senator from Maryland, who retired from service on March 4, 1899, was born in Howard County, Md., March 11, 1839. He was educated in public schools, and from 1852 till 1866 served as a page in the United States Senate. From 1866 till 1869 he was a collector of internal revenue for Maryland; in 1866 he became a director of the Chesapeake and Ohio Canal Company, of which he has been president since 1872. From 1869 till 1875 he was a member of the Maryland House of Representatives, and was its speaker in 1873-75. In 1875-81 he was State senator, and in 1881 was elected to the United States Senate, where he served until 1899, when he failed to be returned. Senator Gorman's last act in the Senate was to lead the opposition in its attempt to defeat the peace treaty ratified on February 6.

GOWING, RICHARD, English journalist, died January 12, 1899. He was born at Ipswich, county Suffolk, in 1831. After serving on various newspaper staffs in Ipswich, Birmingham, Exeter, and London, he accepted the editorship of the *School Board Chronicle*, which position he retained from 1873 to 1894; from the former year to 1877 he was also editor of the *Gentleman's Magazine*; and from 1877 to the time of his death he was secretary of the Cobden Club, the well-known London free trade organization. In 1896 he edited *Richard Cobden and the Jubilee of Free Trade*;

among his writings are: *Public Men of Ipswich and East Suffolk*, 1875; *Richard Cobden*, 1885; *A Pilgrimage to the West; Canada and the United States*, 1897.

GRADE CROSSINGS. See RAILWAYS (paragraph Grade Crossings).

GRAIN ELEVATORS. In exterior aspect the modern grain elevator is a windowless rectangular structure surmounted by a cupola-like superstructure. The main body of the building, called by elevator men the "house," is mostly occupied with bins for the storage of grain, while the surmounting structure, which is generally three stories high and is called the "cupola," contains the operating machinery and working rooms. Generally the topmost story of the cupola contains the leg driving machinery and turn-head spouts, the middle story the garnerers, and the lowest story the weighing hoppers and cleaning machines. Below the cupola and main roof and extending over the entire width and length of the house is the distributing or spout floor. Here are the conveyers for transporting lengthwise of the building, and the distributing spouts for transferring by gravity from the scale hoppers to the bins. By means of the legs reaching from the bottom of pits sunk below the foundations of the bins to the topmost story of the cupola, and containing bucket conveyers, the grain is elevated to the turn-head spouts and discharged into garnerers. From these it passes to the lower floors, where it is weighed, cleaned, if desired, and finally spouted to its proper bin.

In the past the almost universal construction of grain elevators was of timber, sometimes with thin brick outside protecting walls for the house and corrugated iron covering for the roof and cupola walls. This incombustible outer covering was employed essentially as a protection against fire from the outside. For this purpose it was of course a better construction than unprotected wood, but the building being structurally destructible by fire when it once gained access to the inside or when it started inside the building, the fire risk was nevertheless very great, and insurance rates were very high. This condition of affairs has led during the last two years to the construction of elevators which were structurally fire-proof or slow-burning. In the great Northern elevator, built at Buffalo, N. Y., cylindrical steel bins are substituted for the wooden bins of the old construction. The walls of the house are of brick, and the framing and covering of the cupola are of steel and iron. The floors consist of steel plates laid on steel beams and joists. All fixtures are of metal, electric lights are employed, and everything is designed to reduce danger and destruction by fire. The capacity of the elevator is 2,525,000 bushels, the bulk of which is provided for by 30 steel bins 15½ feet in diameter. In the elevator "Electric," of 1,000,000 bushels capacity, also located at Buffalo, N. Y., the plan of separating entirely the operating and storage departments has been adopted. All the operating, including elevating, weighing, cleaning, etc., is done in the operating house, which is a steel frame iron-covered building. The storage is effected in hermetically tight steel cylinders, located near by, but separate from the operating house. The grain is transferred to the storage tanks from the operating house by pneumatic conveyers. Several other elevators of practically the same construction as the "Electric" have been built at other places. The most important of these is located at Fort William, Ontario, which has 16 tanks 58 feet in diameter and 60 feet high, placed in two parallel rows, and 32 tanks 29 feet in diameter and 60 feet high, placed in two parallel rows between the two rows of large tanks. In the new "Fitchburg" elevator at Boston, Mass., which has a capacity of 1,000,000 bushels, the attempt has been made to secure fire-proof construction while retaining the wooden-bin construction of former practice. The construction adopted is practically the steel framework and fire-proof floor construction used for modern fire-proof tall buildings. See TALL BUILDINGS.

GRAND ARMY OF THE REPUBLIC. First organized in 1866, the first national encampment having been held in November of that year. In June, 1899, there were 6905 Grand Army posts, and 287,981 members distributed in 45 departments. National encampment for 1900 to be held at Chicago, Ill. Commander-in-chief, Albert D. Shaw (*q. v.*), Watertown, N. Y.

GRANGE, NATIONAL, PATRONS OF HUSBANDRY, an association of farmers, formed in 1866, has for its objects the following reforms: Postal savings banks, food laws, rural free mail delivery, additional powers for the Interstate Commerce Commission, speedy completion of Nicaragua Canal, prevention of pooling of railroads, investigation of foreign trade relations, election of United States senators by popular vote, and international arbitration. There are 27,689 subordinate granges in 44 States and Territories. Master, Aaron Jones, South Bend, Ind.; secretary, John Trimble, Washington, D. C.

GRAPHITE. Corrected returns show that the production of graphite in the United States in 1898 amounted to 2360 pounds of crystalline material and 890 short tons of the amorphous graphite. The production of the former is the largest on record. Most of the supply came from Ticonderoga, N. Y., and Chester County,

Penn., while Clay County, Ala., yielded a small amount. The manufacture of artificial graphite from coke has met with much success. The process consists in subjecting the coke to as high a temperature as is obtainable in the electric furnace, the result being that the carbon of the coke is principally converted into graphite, although this change may be affected by the presence of such impurities as silica. An elaborate description of the graphite deposits of Ceylon has been published by Diersche. The graphite occurs in gneiss, and is quarried by natives. An amount valued at about £430,000 is exported annually. E. Weinschenk has issued *Der Graphit, sein wichtigsten Vorkommenisse und seine technische Verwerthung*.

GRAVES, CHARLES, D.D., D.C.L., Bishop of Limerick, died July 15, 1899. He was born in Dublin, November 6, 1812; was educated at Trinity College, Dublin, in which institution he was a fellow from 1836 to 1866, and professor of mathematics from 1843 to 1862. In 1860-66 he was dean of Chapel Royal, Dublin, and president of the Royal Irish Academy in 1861-66; also in 1864-66 he was dean of Clonfert. In the latter year he was advanced to the bishopric of Limerick. Bishop Graves was a fellow of the Royal Society. His publications include: *Two geometrical memoirs* (1841)—*General Properties of Cones of the Second Degree and Spherical Conics*; *Suggestions with Respect to the Publication of the Brehon Laws*, 1851, and two episcopal charges, 1867 and 1869.

GRAVING DOCK. See DRY DOCK.

GREAT BRITAIN and THE BRITISH EMPIRE. The area of the United Kingdom of Great Britain and Ireland is 120,979 square miles, with a population, according to the last decennial census in 1891, of 38,740,180 (estimated in 1899 at 39,800,000). Estimates as to the area and population of the colonies place their extent, in round numbers, at 11,250,000 square miles, and the number of inhabitants at about 344,000,000 (estimated at 414,000,000 in 1899). The number of British in the United Kingdom in 1897 was estimated to be 39,500,000, with 10,500,000 British in the colonies. Details in regard to the various possessions of Great Britain may be found in the separate articles on the British colonies, protectorates, and dependencies. A recent report of the United States Treasury Department gives the following area and population of the British possessions, grouped under several great land divisions:

	Area, Square Miles.	Population.
India and feudatory states.....	1,800,258	287,223,431
Europe.....	121	196,889
Asia.....	147,377	5,076,422
Africa.....	2,514,760	39,875,520
America.....	3,614,338	6,882,960
Australasia.....	3,173,558	4,793,900
In the Pacific.....	.....	10,000
Total	11,250,412	344,069,122

Mineral Products of the United Kingdom.—The principal minerals, named in the order of importance as to the value of the amount produced in 1897, are coal, iron, slates, sandstone, clays, limestone, salt, oil-shale, granite, basalt, lead, tin, chalk, gypsum, and zinc. The most important non-metallic mineral is coal, of which 202,129,931 tons were raised in 1897, an increase of nearly 7,000,000 tons over the previous year, and 202,054,516 in 1898. The principal coal fields are in Durham, Yorkshire, Lancashire, Staffordshire, and Derbyshire, in England; Glamorgan, in Wales, and Lanarkshire, in Scotland. In iron about 13,787,878 tons were produced in 1896, the value being £3,217,795. The exports of coal are quite large, being about 37,000,000 tons in 1897, but iron ore exports are insignificant. (See, however, paragraph on Manufacturing.) On the other hand, there were imported during the first six months of 1899 about 3,640,000 tons of iron ore, most of which came from Spain. The position of England as a manufacturing centre makes necessary not only all her large home production, but a constantly increasing amount of foreign ore. There were in 1897, 380 blast furnaces in operation, and 21,327,013 tons of ore were smelted. British tin, of course, is famous the world over.

Agriculture.—Permanent pasturage occupies the largest acreage of the productive area of Great Britain and Ireland, the next largest being grain crops, and the next clover and grasses and green crops. The acreage in 1898 was in Great Britain as follows: Grain crops, 7,400,335; clover and grasses, 4,911,189; green crops, 3,133,521. The yield of wheat, 73,020,000 bushels, and of barley, 68,051,918, were the largest recorded; and the oats harvest, 118,020,917, is said to have been exceeded only twice. Experiments made in sugar-beet growing resulted in an average yield of

19 tons 17 cwts. per acre, a good showing, since the average for Germany and France was only about 11.12 tons. The year 1899, according to an estimate published in the United States Consular Reports for November, 1899, was, on the whole, a poor one for the stock farmer and the dairyman and for the grazing interests, and only a moderate one for the corn grower. Owing to drouth and other causes, the amount of hay for 1899, estimated at 7,537,000 tons, was 2,500,000 tons below the crop of 1898, and about 550,000 tons below the average for the previous ten years. Wheat was a good average crop, while barley and oats were but moderate.

During the last ten years agricultural conditions have been closely studied with a view to ascertaining the causes of depression. A number of official reports have been published on the subject and have called attention to some very important facts. It has been shown that the decline in agriculture has not only closed an important source of revenue, but has resulted, on a large scale, in the transfer of the population from the country to the cities—a transfer which has overburdened the charitable agencies of the latter. In a recent publication it is shown that the per capita cost of the poor law relief was \$131.25 in London as compared with \$64 in England and Wales, and that although the number of paupers in England and Wales has decreased since 1874, the cost of their maintenance has nearly doubled. And besides these indirect results of the bad state of agriculture, the farmers themselves have suffered greatly, owing to the shrinkage in agricultural prices and the decline in rural values. As to the landowner, he is apparently worse off than the farmer. An important feature of the changed conditions of agriculture is the transfer of arable land to pastoral purposes. It is estimated that the low price of grain led in 1895 to the abandonment of over 500,000 acres of grain lands. In 1898 a large part of this, about 220,000 acres, was reapplied to grain-producing purposes, but the pastoral lands still remain the larger part of the productive area. In 1898 53½ per cent. of the cultivated lands in England were pastoral, 68½ per cent. in Wales, and 28½ per cent. in Scotland, making an average of 51 per cent. for all Great Britain. Although lands used for pastoral purposes have increased, the production of animal food has not increased in proportion. It is estimated that the number of cows is less per thousand than in 1875. Meats and milk products show a comparatively slight increase in domestic production, while the importation has more than doubled in each case. In 1898 the foreign meat produce was one-third of the total as against one-fifth of the total twenty years before. In the face of this growing dependence upon foreign food products, it is not strange that the maintenance of a strong navy should be regarded as a vital necessity. It is a fact which perhaps explains the recent movement to make the cereals contraband of war. It is said that the condition of agriculture has shaken the confidence of investors in securities based upon agricultural land. It is certain that capital values have greatly depreciated. Unfortunately, the tax valuation has not taken due account of the declining value of agricultural land. The agricultural depression is, of course, due primarily to the sinking of prices on account of the improvement of transportation and the competition of new districts. Under present conditions there is slight chance of accumulating capital for improvements on the land, since the landlord gets practically no return corresponding to economic rent and barely receives a sufficient return to yield a low rate of interest on his investment. It is even feared that the pressure which is brought to bear upon the tenant farmer may tend to bring in the rack-renting system, reducing him to the level of the Irish tenant of former years. If this happened, it would be due wholly to conditions over which the tenant had no control, and not to any incapacity on his part, for the tenant farmers of Great Britain are regarded by many as among the best farmers in the world.

Manufactures.—Statistics of British manufactures in 1899 were not available, and it is only from the figures of her foreign trade, especially those showing the imports of raw materials and the exports and imports of manufactured goods, that her industrial condition can be determined. Among the raw materials imported, two of the most important are wool and cotton. In 1898 about 2,128,000,000 pounds of cotton were brought in, nearly all of which was used in manufactures. Wool imports were about 812,000,000 pounds, half of which amount came from Australia; of the total wool imports, about equal amounts were reshipped and retained for home manufacture. Other raw materials imported for the use of textile manufactures are flax, hemp, jute, silk, etc. Altogether about 5,000,000 persons were in 1899 dependent upon the cotton, woollen, and linen industries, the aggregate capital of the concerns which employ them being in 1899 nearly \$1,000,000,000. (See *COTTON AND THE COTTON INDUSTRY*.) Besides textiles, Great Britain manufactures and largely exports cutlery and other metal wares; iron and steel manufactures, especially machinery and mill-work; earthen-ware, and other articles, which have long been famous as of British make. In the production of pig-iron Great Britain formerly led with an output of 50 per cent. of the world's supply; at the present time the United States is in the lead with one-third the world's annual output, but Great

Britain still produces nearly a quarter of the total amount. In 1899 the production of pig-iron was 9,309,000 tons, an increase of about 700,000 tons for the year. The year 1899 was a remarkable period for iron and steel industries throughout the world, there being a greatly increased output of ore, together with a still greater demand for the product, and high prices for ore, pig-iron, and the iron manufactures. The world's output of pig-iron increased by nearly 4,000,000 tons, reaching 39,848,867 tons; the output of ores increased by nearly as much again, and fully 2,000,000 tons were added to the production of steel. These figures, given in a recent publication of the United States Treasury Department, show that the enormous increase of pig-iron is largely due to the development of the United States, and that the British increase is proportionately small. In recent years Great Britain's manufacturing trade has been threatened by the great industrial growth of Germany and the United States, not only in the world at large, but in the United Kingdom itself. In explanation of this it has been alleged that the British manufacturer does not avail himself of the latest improvements in machinery; that the British mechanic is not now as technical as the American and the German mechanic, and that the labor market is continually being disturbed by strikes and lockouts. The United States Consular Reports state, however, that British manufacturers are becoming more enterprising in using up-to-date plants (the machinery coming largely from the United States), and that technical schools are being opened in most of the manufacturing towns. A significant fact in connection with the latter movement is the endowment by Andrew Carnegie in 1899 of a technical college in Birmingham University, to be carried on along the lines of the best American engineering schools. It may be added that the notable increase during 1898 of American exports into Great Britain was chiefly in manufactures. Important articles were electric elevators, locomotives, and machinery, the large orders for which aroused considerable protest in England. These orders were undoubtedly due in part to the fact that British engineering works were already overcrowded with work, and one of the things urged by the American consuls in England is that United States manufacturers should send over only their most finished stock. In 1899 English manufacturers were much excited over the award of the Atbara Bridge contract in Egypt to an American concern. In this case the Englishmen were hopelessly underbid, both as to price and the time of delivery. See EGYPT.

Ship-building in Great Britain.—If Great Britain is at present the most important manufacturing nation, she is much more a leading country in mercantile-marine ship-building. According to the United States Consular Reports for June, 1899, the total ship-building output of this class for the world in 1898 is estimated at 1,893,000 tons, of which 1,367,570 tons gross were launched in the United Kingdom. The number of vessels was 761, of which only 17 were sailing vessels. In addition to these, there were launched in the United Kingdom 41 war-ships with a tonnage of 191,555. There were under construction also at the close of 1898, 584 vessels of 1,401,087 tons gross, not including war-ships being built. Not a single new vessel added to the British registry in 1898 was of foreign construction. The large volume of orders placed with British ship-yards has involved the employment of other import concerns, and the estimate has been made that work was thus furnished in 1898 to the engineering and electrical industries generally to the value of at least £5,500,000, and not less than £5,000,000 to iron and steel manufacturers. By the same estimate the total value of mercantile ship-building completed in 1898 was £20,000,000, and that of war-ships for British and foreign navies, including guns and other equipment, amounted to an equal sum. It was expected that the ship-building business for 1899 would be considerably greater even than that for 1898. Of the tonnage of 1,893,000 launched last year in British yards, 1,131,000 were under Lloyd's survey, and early in 1899 there were being constructed under Lloyd's survey about 1,186,000 tons of vessels. Among these new vessels a number of the largest were being built for the transatlantic trade, with Liverpool as the British port. According to recent statistics, the value of ships built in British yards for foreign registry during January and already delivered was \$2,649,623; in February the value was \$990,455. The launching of the *Oceanic* for the White Star Line in January has been commented upon as restoring Liverpool to its former position of being the home port of the largest ship in the world. It is not generally known that the *Oceanic* was largely built of American steel plates, the supplying of which to British ship-builders has become a permanent trade.

Commerce.—The total imports of the United Kingdom in 1898 were £470,604,198, a gain of about £20,000,000 over 1897, and of nearly 22 per cent. within a decade. The principal items of import, in the general order of importance, are grain and flour (about two-thirds of wheat and wheat flour from United States), raw cotton (two-thirds from United States), wool (largely from Australia), and sheep, meat, sugar, butter, timber, flax, hemp, jute, tea, etc. Of the countries from which Great Britain imports, the United States is far in the lead, with a value of goods for the

year 1897 of £113,042,000; then follow France, £53,347,000; Holland, £28,971,000; Germany, £26,190,000; Russia, £22,284,000; Belgium, £20,886,000; Spain, £13,126,000, and Denmark, £10,968,000. The export trade of Great Britain was in 1898 about £233,390,792, a slight decrease below that of 1897. In addition, there were about £60,000,000 exports of foreign and colonial produce. The chief items of British export are woollen and worsted goods, iron and steel wares, linen and jute manufactures, machinery, etc. The countries to which exports are sent are, according to 1897 statistics, first, Germany, receiving goods valued at more than £21,600,000; second, the United States, nearly £21,000,000, and third, France, about £13,819,000. Then follow Holland, Belgium, and Russia, approximately £8,000,000 each, and Turkey, about £6,500,000; Japan, Italy, Brazil, and China, about £5,500,000 each; Argentine Republic and Egypt, about £4,500,000 each, and Sweden, Spain, and Denmark, approximating £3,500,000 each. As to British colonies receiving exports from the mother country, India took in round numbers over £27,380,000; Australia, £21,311,000; British North America, £13,666,000, and South and East Africa, £5,476,000. The United States has in recent years given way to Germany as the largest buyer of British goods, the falling off of British exports to this country being generally attributed to the American tariff.

The foregoing comparative statistics will give a good general idea of the condition of British trade at the present time. Complete statistics for 1899 were not available, but it may be said that business in Great Britain was, broadly speaking, in a very satisfactory condition, in spite of the war with the Transvaal in South Africa. Imports showed a steady increase, their value for the year ending October 31, 1899, being £487,763,325, as compared with £465,865,460 for the similar twelve months in 1897-98. The largest increase was in the importation of metals and raw materials for various industries. Less American copper than usual was brought in, owing to the high prices which prevailed on that metal. An important result was the opening up of new British mines, especially in the copper regions of Australia. One other principal import showed a falling off in 1899—namely, raw material for the textile industries, especially jute and wool, owing mainly to a shortage of supplies. As to exports, the value for the twelve months ending with October, 1899, was £258,637,517, which is a gain over the previous twelve months, as compared with a slight loss during the calendar year 1898. Coal exports increased, France's purchases increasing by one-third, and Germany and Brazil also buying more freely. The year was one of unusual activities in the iron and steel trade, exports increasing in pig-iron, hardware, and cutlery, machinery, locomotives. The export of bicycles continued to rapidly decline during 1899, the decrease being over 30 per cent., and the tin-plate shipments showed a general falling off, which became marked in the case of the United States, which now produces tin plates in large quantities. Cotton goods declined on the whole, though this country took twice as much cotton yarn and twist as in 1898. As to the total United States trade, British exports to this country in the calendar year 1899 were, according to United States Treasury Reports, \$142,321,497, a gain for the year of \$31,022,694, as compared with a loss in 1898 of \$47,703,483; and imports from the United States amounted to \$509,958,335, a gain of \$28,799,692, as compared with a gain in 1898 of \$56,063,003. The large balance of all British imports over British exports is largely caused by the small purchases and the large sales of the United States in Great Britain. The result is a growing concern in England over American rivalry. A like agitation is now going on among manufacturers in Germany (*q. v.*), where conditions are somewhat similar. Great Britain's merchant marine in 1899 included 70 per cent. of the steamers of the world. At the beginning of the year it numbered, according to Lloyd's, about 20,400 vessels, with an aggregate gross tonnage of 13,368,853. The number of steam vessels was 8835, with a tonnage of 10,816,310. Four lines, the Cunard, Peninsular and Oriental, White Star, and Canadian Pacific, receive subsidies from the government, in return for which certain of their vessels are available to Great Britain as reserve cruisers in time of war. The total subsidy granted is £48,600 annually.

Navy.—According to the uniform classification of the 1899 publication of the United States Navy Department on naval progress abroad, the British navy, as reported in July, 1898, consisted of 52 battleships, and 12 building; 18 armored cruisers, and 8 building; 95 protected cruisers, and 24 building; 16 unprotected cruisers; 15 coast defence ships; 35 torpedo vessels; 50 torpedo boat destroyers, and 46 building; 98 torpedo vessels, and 3 ships for special purposes. The total displacement of built vessels, exclusive of torpedo boats, was 955,000 tons, or 1,000,000 tons estimated for 1898-99. The vessels to be built or completed between 1898 and 1903 include 16 battleships, 30 cruisers of various classes, and 4 gunboats. The total tonnage of all English cruisers now (1899) under construction is, according to United States Navy Reports, greater than that of the cruisers, contemplated or building, of all the remaining European powers. The vessels to be built during 1898-1903 alone are superior in power to the total German navy in 1903. The tonnage of these same new vessels

exceeds the total tonnage of the war vessels of the United States Navy, built and building, by more than 100,000 tons displacement. It is the announced policy of Great Britain to make her navy equal in strength to the navies of any other two European powers. In 1899, 21 large and 14 small vessels were laid down, with a tonnage of 247,900. The total number under construction during the year was 49 large and 51 small vessels, with a tonnage of 531,680. There were launched, in 1899, 6 battleships, 1 cruiser, and 5 gunboats, the royal yacht, and 3 torpedo boat destroyers.

Army.—On January 1, 1899, the various ranks of the British army were distributed as follows: At home, 106,686; Egypt, 4257; India, 74,466; colonies, 37,363, in addition to 7242 local forces. This was greatly changed during the year, owing to the war in South Africa, and the drafting of troops from England, India, and elsewhere. The total number of troops sent to South Africa up to the close of 1899 was about 65,000. The total cost of the army in 1898-99 was £19,220,500. The estimate made for 1899-1900 was £20,617,200, but this will be greatly increased by the war. The total of the regular army, together with its reserve, militia, and volunteers, amounted to 665,000 on January 1, 1899. The first-class army reserve numbered nearly 79,000 well-disciplined men. This branch of the service was called out by proclamation in October for the mobilization of a large field force. This is said to be the first experience of real mobilization in Great Britain.

Education.—There were registered at the beginning of the year 1899 at the institutions of higher learning in the United Kingdom about 24,500 students, the total teaching force being 1596. The universities of Cambridge and Oxford are among the most famous in the world, as well as among the oldest, though they were founded at a later date than some of the continental universities. Cambridge, with its 19 corporations or colleges, has a teaching staff of 122, and a student body of over 3000. Oxford, with 23 colleges, has a teaching force of 91, and an attendance of about 3500. In Scotland are the four noted universities of Aberdeen, Edinburgh, Glasgow, and St. Andrews. In Ireland is the University of Dublin. Two educational questions in England which were prominent in 1899 were, first, the reorganization of London University, hitherto only an examining body, with power to grant degrees; and second, the establishment of a Birmingham university, which shall have as one of its foremost branches the teaching of commercial education in all its branches. The new London University will become a teaching body, and it was settled during the year that it will be housed in the buildings of the Imperial Institute, for the purchase and alteration of which the sum of £60,000 has been granted by Commons. The Birmingham University had received subscriptions during the year of more than £225,000, including a large gift from Andrew Carnegie for a technical college founded on American lines. By the incorporation of the present Mason College also the sum of about £200,000 in endowments will become available. Secondary education is entirely unorganized except in Scotland, where school boards administer the burgh schools. According to the latest trustworthy statistics, which cover the United Kingdom, there were (August 31, 1897) about 19,960 elementary schools inspected in England and Wales, with accommodations for 6,215,199 pupils. About 9000 elementary schools were reported in Ireland in 1897, and in Scotland were 3086 schools, with accommodations for 843,769. Primary education is receiving more attention than formerly. The agitation in favor of instituting various reforms resulted in 1899 in provision that after April 1, 1900, primary, together with secondary and technical education shall be under the sole control of a board of education, which shall take the place of the present Education Department and that of Science and Art, the president to be appointed by the Queen, and to be eligible to a seat in Commons. There will also be a consultation committee, two-thirds of whose members shall be qualified to represent the universities and other educational bodies. There is a separate department for Scotland. The department in Ireland is under the Commissioners of National Education, Dublin. Cost of school administration, 1896: England and Wales, £398,910; Scotland, £49,149. A second act of 1899 was that known as the Half-Timers act, which will take effect on January 1, 1900. It requires that children must attend school up to the age of 12 years at least.

Finances.—During the year ending March 31, 1898, the amount of public revenue collected was £106,614,004, and the national expenditure was £102,935,994, leaving a surplus for the year of £3,678,010. In 1898-99 the income was £108,336,193, and the expenditure £108,150,235, leaving a balance of £185,858, a large decrease in the surplus. The budget for the year 1899-1900 estimated that the revenue would be £110,287,000, on the basis of taxation then existing, and the expenditure £112,927,000, leaving for the first time in some years an estimated deficit the amount of which was £2,640,000. To meet this deficit additional duties were in 1899 imposed on imported wines, which were estimated to produce £420,000, and alterations made in the stamp duties to produce an increase of £450,000. To reduce the expenditure the amount of £2,000,000 was deducted from the sum annually set aside for the service and redemption of the national debt. The final budget for 1899-1900 then showed an estimated

revenue of £111,157,000 and an expenditure of £110,927,000, leaving a balance of £230,000 for contingencies. Sir Michael Hicks-Beach, in commenting upon the new budget, said that the rapidly increasing expenses of the government were mainly due to increased armaments, and that however great the prosperity of the country might be it was impossible to meet such increases by a mere automatic increase of existing taxation, nor could they be met for long by any increase of existing taxes. The discovery of new and productive sources of revenue must be found. Unusual causes caused a still further rearrangement of this budget, owing to supplementary estimates of £278,000 made by the House of Commons, in July, and the unforeseen expenditure of £10,000,000 for South Africa, bringing the total expenditure of the 1899-1900 budget up to £121,205,000. Owing to unlooked-for increases in the revenue also the chancellor of the exchequer estimated an additional income of \$3,000,000. He proposed to provide the balance necessary to meet the war expenses by a temporary loan, to be charged to the national debt fund. Further war expenses should be paid in part, he thought, by the invaders of British colonies in Africa, when the war should be brought to a successful termination. The conduct of the exchequer came in for some severe criticism, especially the reduction of the funds set apart for the payment of the debt. The national debt amounted on March 31, 1899, to £58,966,831 net. This amount is the growth of many years, and was mostly raised for foreign wars. During the last ten years it has been annually decreased by from five to eight millions. The decrease in 1899 was £6,873,119.

HISTORY.

Parliamentary Sessions.—The regular session of Parliament opened on February 7, 1899. On the eve of the session Sir Henry Campbell-Bannerman was chosen as Liberal leader of the House of Commons to replace Sir William Vernon Harcourt, who had withdrawn from the leadership in the latter part of the preceding year. The relative strength of the political parties in the House of Commons was as follows: Conservatives 337, Liberal Unionists 66, giving a total Unionist vote of 403; Liberals 184, anti-Parnellites 71, Parnellites 11, giving a total opposition, counting in the speaker, of 266. Thus, the Unionist majority in the House was 137. The Queen's speech was, as usual, mainly taken up with a review of political events. In conclusion, it promised the introduction of a large number of bills, including among others the provision for agricultural and technical instruction in Ireland, for the relief of the tithe rent-charge payers, for a board of education for England and Wales, for a local government bill for London, and for aiding the occupants of small dwellings in the purchase of their homes. Among the principal measures passed during the session, which closed on August 9, 1899, were the following: The London Local Government bill, which provided for a better local government for the administrative county of London by dividing it into boroughs, each with its own mayor, councillors, and aldermen; the Tithe Rent-Charge act, which exempted the owner of a tithe rent-charge from the payment of one-half existing rates; the Colonial Loans act, which granted a credit of £3,351,000 to 17 crown colonies; an act placing the West African territory, administered by the Royal Niger Company, under the control of the imperial government; the Small Houses act, which empowered the local authorities to advance money to a resident in any house within the area for the purpose of enabling him to acquire the ownership of that house; the Board of Education act, establishing a board of education for England and Wales. In the autumn the critical state of affairs in South Africa necessitated the calling out of a reserve to strengthen the military forces of the country, and a special session of Parliament was decided upon. The autumn session lasted from October 17 to October 27, and its main work was the passage of the Consolidated Fund act and the Treasury Bills act. The former appropriated the supplies voted for the army, and applied the sum of \$10,000,000 out of the consolidated fund for service during the year ending March 31, 1900. The latter authorized the issue of treasury bills to raise any sum not exceeding £8,000,000. During this and the preceding sessions the parliamentary debates were of the greatest importance, but the points developed in them can be better brought out in a separate discussion of the important topics of the year.

Church of England.—The ritualistic controversy, which began in 1898, assumed a political form in consequence of the sharp criticism of the ritualistic movement in Sir William Vernon Harcourt's letters to the press. The matter became the subject of an important debate in Parliament. Mass meetings were held in January and February, 1899, and petitions were presented to the crown to enforce the obedience of the clergy to their officers and to the laws of the Church. The lawlessness of the clergy was discussed in Parliament, and finally a resolution was adopted to the effect that Parliament deplored this spirit of lawlessness, and expressed a hope that the ministers of the crown would not recommend any clergyman for preferment unless they were satisfied that he would loyally obey the bishops, the prayer-book, and the law as declared by the courts which have jurisdiction in matters ecclesiastical.

tical. The outcome of what the newspapers called "the crisis in the Church" was an inquiry before the Archbishops of Canterbury and York as to the ritualistic practices in the Church. This began at Lambeth Palace on May 7. On September 30 the decision was announced. It pronounced the liturgical use of incense and the carrying of lights in procession as neither enjoined nor authorized by the Book of Common Prayer, and it asserted the obligation of clergymen to use the forms prescribed by the prayer-book. The archbishops, while saying that these practices might not in themselves be unsuitable for divine service, held that it was their duty to request the clergy to discontinue them. The Tithe Rent-Charge act, by which the government exempted the owner of a tithe rent-charge attached to a benefice from payment of one-half the rate, and supplied the other half out of the imperial funds, aroused a vigorous opposition and attracted especial attention on account of the controversies in the Church. It was condemned by the Liberals on the ground that it really meant a fresh endowment for the Church of England, but passed the Commons on July 20.

Irish Affairs.—The distress of the people in certain districts of Ireland led to a motion by Mr. Davitt in Parliament for the enlargement of holdings and the carrying out of feasible schemes of migration, but these measures of relief did not meet with approval and were voted down. The usual motion for legislative independence for Ireland was made after the reading of the address. Mr. Redmond declared that the demand of the people for legislative independence had been intensified by the establishment of local self-government. The motion was voted down by a large majority. Elections of the county and district councils under the new Irish Local Government act were held in January and April, the suffrage being for the first time granted to women. About 70 per cent. of the qualified voters took part in the elections. The result was a complete victory for the Nationalists, who secured five-sixths of the seats. As explained in the last YEAR BOOK, the new system practically gives Ireland home rule in local affairs. The chief object of the Irish demands in 1899, in addition to complete legislative independence for the whole country, was the establishment of a Roman Catholic university. A project for such a university was outlined by Mr. A. J. Balfour. On June 23 the question arose in Parliament, and Mr. Balfour again argued on behalf of the new university. It was characterized by Sir Charles Dilke as part of a plan "to kill home rule with kindness," to which an Irish member replied that the better educated the Irish people become the more intense would be their desire for home rule.

Relief of Poverty.—There was much discussion of charitable measures, both in Parliament and in the press. A Poor Law act was passed extending the powers of poor law guardians in cases where parents are dead or unable to perform their duties, and giving them the right to assume control over such deserted or orphaned children until the latter reach their eighteenth year. Several Old-Age Pensions bills were introduced into the Commons, and were referred to a select committee to consider and report on the best means of improving the conditions of the aged and deserving poor. This committee reported that a system of old-age pensions was practicable, and that in their opinion the attempt should be made on the basis of a scheme which they outlined. The minority report, drafted by Mr. Lecky, pronounced against it. For a general discussion of the subject see the article OLD-AGE PENSIONS. A bill authorizing local officers to provide cottage homes for the deserving poor, the qualifications for admission being that the applicant should be at least sixty-five years of age and needy, and should have led an industrious and deserving life, was reported favorably by the committee, the report urging that the aged and deserving inmates in workhouses should constitute a special class and enjoy special privileges, and "that guardians should provide special cottage homes within the unions, or other suitable accommodations, for married couples and respectable old persons whose poverty is not their own fault, but the result of misfortune."

Foreign Relations and Imperial Affairs.—The chief event in the foreign relations of Great Britain during the year was the settlement of the Fashoda difficulty by the convention of March 21, 1899, between Great Britain and France. This convention, the terms of which will be found under the article FRANCE (paragraphs on History), delimited the claims of the respective powers in the valley of the Upper Nile. An important agreement was reached with Russia on April 28. By this each government agreed not to seek on its own account, or on behalf of its subjects, any railway concessions in the sphere of influence of the other—that is to say, the British government engaged not to interfere north of the Great Wall, and Russia, on her side, agreed not to interfere in the basin of the Yang-tse. The agreement concluded with the declaration that the two parties had no intention of infringing on the sovereign rights of China. (See the articles CHINA and RUSSIA.) Toward the close of the year there were rumors of important negotiations between Great Britain and Russia in regard to certain demands of the latter power in connection with the

Russian advance in Central Asia. (See the article *AFGHANISTAN*.) With Germany Great Britain entered into an important agreement in regard to Samoa, renouncing the British rights in the islands, and ceding to Germany the British territories, with the consent of the United States. (See *SAMOA*.) On November 20, Emperor William visited Queen Victoria at Windsor Castle, and this was taken by many as a sign of closer relations between the two powers, and as having something to do with a general Anglo-German agreement. It is not clear, however, that the visit had any political significance apart from the natural effect of promoting a greater spirit of friendliness between the two powers. Mr. Chamberlain, in his speech of November 30, spoke of a new alliance which should include England, Germany, and the United States, but this reference was not taken seriously. The visit did much to remove the unpleasant impression created in England by the Emperor's famous despatch to President Kruger at the time of the Jameson raid. With the United States, the chief matter of discussion was the Alaskan boundary, which was at one time the occasion of much ill-feeling on the part of Canada and the United States, but which seemed likely to reach a satisfactory settlement toward the close of the year. (See *ALASKAN BOUNDARY DISPUTE*.) As to The Hague conference, the speech from the throne referred to the sympathy of the British government with the objects of the conference, and its intention of being represented at The Hague. The co-operation of the British and American representatives at the conference aided in the carrying out of some of its important practical objects. (See *HAGUE CONFERENCE*.) As to the events in the outlying parts of the empire, they are more properly included in the articles on the British colonies and dependencies, and the present article will refer only to certain aspects of imperial affairs. The great centre of interest from the beginning to the close of the year was Africa. In the early part of the year it was announced that a convention had been concluded between the representatives of Great Britain and Egypt, giving the latter power the control over the Soudan. A discussion of the proposal to bestow money and honors upon Lord Kitchener and the others who had distinguished themselves in the Egyptian campaign, brought out some severe criticism in Parliament, based on Lord Kitchener's alleged brutality at the Mahdi's tomb. The remains of the Mahdi had been removed from the tomb and destroyed. The justification alleged for this was the necessity of preventing the tomb from becoming a shrine and the focus of fanaticism. Before the close of the year the last vestige of the Mahdi's power was overthrown in the Soudan by the defeat of his successor, the Khalifa, who was killed in the action. (See articles *EGYPT*, *FRANCE*, and *SOUDAN*.) Another important event in Africa was the transfer of the administrative powers of the Royal Niger Company over West African territory to the crown. This company had been most successful as a trading company, and had comprised within its control an area of 600,000 square miles, with a population of about 30,000,000. The preamble to the Royal Niger Company act, effecting this transfer of power, praised the company for its work as a civilizing agent, stating that it had put down slave-raiding, had abolished the legal status of slavery, and checked the trade in spirits with the natives. The effect of the act was to reduce the company to the status of a mere trading company. But the all-absorbing topic of the year was the crisis in South Africa and the course of British relations with the Transvaal republic, which finally resulted in war. An outline of the events that led up to the war, and an account of military operations down to the close of the year, is given in the article on the *TRANSVAAL*. Here it will be possible only to include a brief discussion of the war measures and of the important expressions of opinion made in the course of parliamentary debates and in the press.

South African Crisis.—The negotiations between the British and the South African governments (see *TRANSVAAL*) reached a point in September at which the hope of a peaceful settlement became remote. On August 19, the Transvaal government, after practically conceding the British demands, offered the two counter-propositions that other differences should be referred to arbitration, and that Great Britain should give up its claim of suzerainty. These two proposals were rejected by the British government, and, in its despatch of September 8, the former demands were renewed, and in addition to them it was asked that the English as well as the Dutch language should be allowed in the deliberations of the *Volksraad*. The Transvaal then withdrew its concessions of August 19, and offered merely the seven-year franchise. The British retort was that discussion on this point was useless, and that the government would formulate its demands anew. This was on September 22, after which matters tended to a crisis. In the meanwhile both countries were making military preparations. The British army began to mobilize in September, and the Transvaal government added to its military forces on the frontier. On October 10 the Transvaal government sent in its ultimatum. Its effect was to unify the British political parties, and to convince many that war could no longer be honorably avoided. Then came the special session of Parliament (October 17-27)

for the purpose of empowering the government to call out the reserve. The attitude of the Liberals was defined in the speeches of the Earl of Kimberley in the House of Lords, and Sir H. Campbell-Bannerman, Sir William Vernon Harcourt, and Mr. John Morley in the House of Commons, while the Marquis of Salisbury, Mr. Chamberlain, and Mr. Balfour defended the course of the government. The position of the Liberals was that the action of the South African Republic in sending in its ultimatum had made war inevitable, and that they were ready to support the government in all measures that were necessary to vindicate its honor. At the same time they felt free to criticise the conduct of negotiations in which there were many points that did not meet their approval. They blamed the Colonial Office for what they characterized as the "methods of the new diplomacy." The publication of the despatches, particularly of the telegram of Sir Alfred Milner, which tended to inflame public opinion, was most unfortunate. There was an unnecessarily irritating tone in the demands of the government. This could not but lessen the chances of success. The government was accused of trying to intimidate the Transvaal by the sending of troops to the Cape, as well as to bully the latter power by the tone of its speeches and despatches. The Boer government was said to have offered practically all that was demanded, and there was no justification for the claim that it had shown an obstinate resistance. To go to war for the sake of the reduction of the franchise qualification from seven to five years was absurd. The right of suzerainty was abandoned in the convention of 1884.

On the other hand, it was argued, that the negotiations had been carried on in a friendly spirit; that the new diplomacy, as it was called, was necessary if a minister responsible for the negotiations were to ascertain the feelings of the people, and that the effect of the publication of despatches had been greatly exaggerated. It was said, too, that President Kruger's great ambition had always been to get rid of the word suzerainty, and that he had made up his mind to use the franchise question merely as a means to this end. It was not fair to blame the government for sending troops to Cape Colony; if the troops had not been sent the government would have been blamed still more. Mr. Chamberlain characterized the statement that he and Sir Alfred Milner had been determined on war from the first as a monstrous falsehood. He contended that the convention of 1884 gave the British government the right to interfere in the internal affairs of the South African Republic if British subjects were injured there, and that this right of interference was independently sanctioned by international law. He had hoped for peace and believed in peace from the first, but he insisted that British paramountcy, as he called it, must be maintained in South Africa. As to suzerainty, the word was of no importance, but the substance must remain. The independence of the Transvaal meant its independence as limited by the conventions. The franchise matter was in nowise the cause of the war. The empire was going to war in defence of the principle upon which it had been founded. It could not remain the chief power in South Africa unless it showed its ability to protect British subjects everywhere. The government had accepted every point in the Transvaal despatch except the demand that a pledge should be given that it would never again interfere. The Transvaal then withdrew its proposals.

The Irish members were wholly opposed to the war and blamed the government for its course all through. One of them moved to leave the differences between the two republics to arbitration in order that "an ignominious war may thus be avoided." Mr. Davitt declared that the Boers were wholly in the right and that the war was an act of criminal acquisition. As a protest against the government's course, he resigned his seat in Parliament. The purpose for which the special session had been called was accomplished by the passage of the Consolidated Fund act and the Treasury Bills act, to which reference has already been made. Space will not permit the summarizing of the discussion of the South African question with any fulness of detail, but to illustrate the opinions of intelligent Englishmen on each side of the question, the following extracts may be of value.

Defence of the Government's Course.—One of the ablest and most moderate statements of the British view of the matter is that of Mr. W. E. H. Lecky, the historian. Having blamed the British government for what he considers its mistaken policy in withdrawing from the Transvaal after the battle of Majuba, he says: "I am far from contending that our conduct in other respects was impeccable. There are several pages in the history of the early English dealings in the Transvaal which are by no means to our credit. A mining population like that which had its centre in Johannesburg is never of the most desirable order, and in the present generation financial speculation has mixed far too much, both in England and in Africa, with South African politics. Party spirit runs violently in the Cape, and if there was a Dutch party aiming at complete ascendancy, there was also an English party which was violent, arrogant, and unscrupulous. The raid, though it was undoubt-

edly preceded by gross misgovernment, was both a great folly and a great crime. Our government had nothing to say to it, and the men who took part in it were tried and punished, but a section of the British public, shamefully misled by a very important part of the British press, adopted an attitude toward it which added largely and most naturally to the deep distrust of England which prevailed in the Transvaal. I do not think that the government can be justly blamed for not having prosecuted Mr. Rhodes. Though it is undoubtedly true that he prepared and contemplated a raid, the actual expedition was undertaken not only without his assent, but even without his knowledge; his complicity in the early stages could only be established by his own frank and voluntary statements before a parliamentary inquiry, and it is quite certain that on such grounds no English jury would have convicted him. He had rendered great services to the empire in the past, and there was much that was fascinating in his genius and his daring. But he had done things in connection with the raid which should have prevented a portion of London society from making him a hero, or an English minister from publicly acquitting him of all dishonorable conduct. Such language was at once made use of by the enemies of England in South Africa, and it had the worst effect upon the Boers.

"I do not think, however, that these things made the war. An incurable antagonism of sentiment, type, and ideals had grown up, and the situation I have described inevitably led to a collision. Mere isolated incidents, mere technical questions, have played too large a part in the discussions on this subject, and it can be best judged by looking on its broad features. In England no responsible politician desired the war, and almost to the last moment very few believed in it. There was not, I believe, the smallest desire among the ministers to annex the Transvaal, but there was a determination to put an end to the bad government at Johannesburg and to the constant unrest which it produced, and to secure for the English-speaking population the same kind of privileges which were enjoyed by the Dutch in our own colonies. When, after the raid, the high commissioner exhorted the Uitlanders to disarm, he promised in the name of the British government to endeavor to obtain a redress of their grievances. But, instead of redress, those grievances in the most essential respects had been steadily aggravated. A more patient policy might for a time have postponed the crisis, but it could scarcely have averted it, and there is much force in the contention of Sir Alfred Milner that the evil was a growing one and that the failure of the government to carry their point was undermining all the remaining confidence which the surrender after Majuba had left."

The Other Side.—Mr. Bryce has been one of the most influential critics of the government's policy, and the following quotation is a fair illustration of the position taken by the other side: "Under the convention of 1884, which fixed the relations of Britain and the South African Republic, the latter had the most complete control of its internal affairs, and Britain possessed no more general right of interfering with those affairs than with the affairs of Belgium or Portugal. The suzerainty which has been claimed for her, if it existed (for its existence under the convention of 1884 is disputed), related solely to the power of making treaties, and did not touch any domestic matter. When, therefore, the British government was appealed to by the Uitlander British subjects who lived in the Transvaal to secure a redress of their grievances, her title to address the Boer government and demand redress depended primarily upon the terms of the convention of 1884, any violation of which she was entitled to complain of; and, secondly, upon the general right which every state possesses to interpose on behalf of its subjects when they are being ill-treated in any foreign country. Under these circumstances it might have been expected that the questions which would have arisen before Britain went to war for the sake of her subjects living in the Transvaal would be these two:

"First. Were the grievances of her subjects so serious, was the behavior of the Transvaal government when asked for redress so defiant or so evasive, as to contribute a proper *casus belli*?

"Secondly. Assuming that the grievances (which were real, but in my opinion not so serious as has been frequently alleged) and the behavior of the Transvaal did amount to a *casus belli*, was it wise for Britain, considering the state of feeling in South Africa, and the mischief to be expected from causing permanent disaffection among the Dutch population; and considering also the high probability that the existing system of government in the Transvaal would soon, through the action of natural causes, break down and disappear—was it wise for her to declare and prosecute war at this particular moment?

"Strange to say, neither of these two questions ever in fact arose. That which caused the war was the discussion of another matter altogether, which was admittedly not a grievance for the redress of which Britain had any right to interfere, and which, therefore, could not possibly amount to a *casus belli*. This matter was the length of time which should elapse before the new immigrants into the Transvaal could be admitted to citizenship, a matter which was entirely within the discretion of

the Transvaal legislature. The Boers made concessions, but the British government held these concessions insufficient. In the course of this discussion the British ministry used language which led the Transvaal people to believe that they were determined to force the Boer government to comply with their demands; and they followed up their despatches by sending troops from England to South Africa. They justified this action by pointing out (and the event has shown this to have been the fact) that the British garrison in South Africa was insufficient to defend the colonies. But the Boers very naturally felt that if they remained quiet till the British forces had been raised to a strength they could not hope to resist, they would lose the only military advantage they possessed. Accordingly, when they knew that the reserves were being called out in England, and that an army corps was to be sent to South Africa, they declared war, having been for some time previously convinced, rightly or wrongly, that the British government had resolved to coerce them. They were in a sore strait, and they took the course which must have been expected from them, and indeed the only course which brave men, who were not going to make any further concessions, could have taken. And thus the question whether the grievances amounted to a *casus belli* never came up at all. The only *casus belli* has been the conduct of the two contending parties during a negotiation, the professed subject of which was in no sense a *casus belli*. Some have explained this by saying that a conflict was in fact inevitable, and that the conduct of the two parties is really, therefore, a minor affair. Others hold that a conflict might have been and ought to have been avoided, and that a more skilful and tactful diplomacy would either have averted it, or have at any rate so managed things that, when it came, it came after showing that a just cause for war, according to the usage of civilized states, did in fact exist. No one, however, denies that the war in which England will, of course, prevail is a terrible calamity for South Africa, and will permanently embitter the relations of Dutch and English there. To some of us it appears a calamity for England also, since it is likely to alienate, perhaps for generations to come, the bulk of the white population in one of her most important self-governing colonies. It may, indeed, possibly mean for her the ultimate loss of South Africa."

GREECE, a kingdom of southeastern Europe, has an area of a little over 25,000 square miles, and a population (1896) of 2,433,806. Athens, the capital, had in 1896 about 111,500 inhabitants. There are many Greeks living outside of the kingdom, also, in the islands of Crete and Cyprus; about 2,000,000 are said to dwell in Asia Minor, and nearly 3,500,000 in European Turkey, making a total Greek population of over 8,000,000. Greece is divided into 16 provinces, grouped under the general heads of Northern Greece, Peloponnesus, Thessaly, and the Grecian Islands.

Industries.—Greece is largely an agricultural country, and the lands are mostly in the hands of peasant farmers, with a few large proprietors. Agriculture is not, however, as well developed as might be expected, considering the fertility of the soil. The chief products are cereals, including wheat, barley, rye, maize and mezzlin, fruits, especially the currant; olives, the grape, and the products of the silkworm. The chief exports from among these are currants, wines, fruit, and olive oil. Ores also make up an important export, and among the minerals found are manganese, iron, zinc, speiss, lead and galena, magnesite ore, silicate of magnesia, barite, sulphur, emery, and gypsum. Manufactures, which are comparatively unimportant, include engines, leather, thread, cloth, glass, and flour.

Commerce.—The imports into Greece during 1898 amounted to \$29,601,557, an increase of \$7,452,622 over 1897, in the first half of which occurred the Græco-Turkish war; the exports in 1898 were \$17,409,232, an increase of \$1,827,556. In 1897, in spite of the war with Turkey, there had been an increase over the exports of 1896 to the amount of over \$1,500,000, and this increase, it will be seen, was not greatly exceeded by the gain of exports in 1898. The increase of imports, however, in 1898 was much greater than the increase of imports in 1897, which had shown a gain of but \$223,284; thus the 1898 imports showed an actual gain for the year of over thirty-three times the actual import gains of 1897. This increase of imports in 1898 would seem to indicate a growing prosperity in Grecian trade, and it may be noted that the increase in exports also was in 1898 really greater than indicated in the figures given above, owing to the fact that an actual decrease for the first eight months of 1898 was met by such a large amount of exports in the balance of the year as to make the final increase over 1897 of \$1,827,556. Piræus is the chief Hellenic port for imports. Goods are brought in by means of various weekly steamship lines, including 4 Italian steamers, 4 Austrian, 2 French, 2 German, 2 Russian, 2 Egyptian, and 1 English; fortnightly service embraces 1 English steamer, 1 Dutch, and 1 Danish; in all about 75 regular foreign arrivals monthly, besides numerous irregular calls. There is now proposed a direct line of steamships from the United States to ports of the eastern Mediterranean for the purpose of increasing American trade in that part of Europe.

Finance.—By the war with Turkey, Greece not only had to undergo the humiliation of defeat, together with an indemnity and territorial loss, but she also had to accept international control in financial affairs. Representatives of the mediating powers, Germany, Austria, Hungary, France, Great Britain, Italy, and Russia, constitute the international commission, which collects, as security for the loan which the Greek government was authorized to raise, the revenues from monopolies, tobacco, stamps, and the Piræus customs. This loan amounts to £6,800,000, at 2½ per cent., in two issues of £5,004,900 and £1,795,100. The first issue has been applied to the payment of the war indemnity due to Turkey, the indemnity being 4,000,000 Turkish pounds; and of private indemnities of the war, 100,000 Turkish pounds, the balance being applied in aid of Greek finance. In 1899, according to the estimated budget, the ordinary revenue amounted to 89,639,640 drachmæ, and the administrative expenditure to 64,051,326 drachmæ. In addition to the latter, the loan of 1833 (guaranteed by Great Britain, France, and Russia) and the external debt involved the payment of 15,658,750 drachmæ; certain special payments to old creditors, 1,780,000 drachmæ; internal debt and withdrawal of forced currency, 5,145,610 drachmæ; total expenditure, 86,635,686 drachmæ, leaving a balance of 3,003,954 for the new loan, the receipts of which were 8,000,000 drachmæ, making 11,003,954 the total available receipts. The expenditure paid on the new loan, etc., amounted to 13,054,186, making a deficit at the end of the year of 2,050,232 drachmæ. The amount of revenue which was collected by the commission on monopolies, stamps, tobacco, and customs was 35,420,000 drachmæ. The monopolies include the sale of salt, petroleum, emery, matches, playing cards, and cigarette paper. The heaviest branches of expenditure are the service of the public debt, and the ministries, the army, and the interior. The public debt in September, 1899, was estimated to be 701,374,500 drachmæ gold, and 93,775,974 drachmæ paper.

Army and Navy.—The total service in the Greek army, to which all able-bodied males above 21 years of age are liable, embraces enlistment in the colors, the reserve, and the militia. The standing army numbers about 25,000, and has a war footing estimated at 82,000 men. There is also a territorial army estimated at 96,000. The navy consists chiefly of five armor-clad vessels and a fairly large number of miscellaneous craft; the complement of the navy includes 3165 men. Both branches of the service are overestimated on paper, the war with Turkey having shown the army to be ill-disciplined and poorly officered, while the navy showed no efficient fighting qualities. The wealthy Greek philanthropist, George Averoff (*q. v.*), at his death in 1899 left an estate valued at \$18,000,000 to be devoted to the improvement of the navy.

Government.—Government is administered by a king and a legislature, or *Boulé*, which meets annually and comprises a chamber of 207 representatives elected for four years. The present monarch, King George I., the second son of the king of Denmark, was elected in 1863, after the expulsion of King Otho. The king's council consists of the ministers of interior, finance, justice, marine, war, and public instruction. The Greek Orthodox Faith is the state religion, but freedom of worship is guaranteed.

HISTORY.

Political Parties.—In 1899 the political party known as the Tricoupists came into power. As their name indicates, they were followers of M. Tricoupis, who at the time of his death, April 11, 1896, had been a prominent figure in Greek political history for twenty years. In April, 1875, M. Tricoupis formed his first cabinet, and the party dates from that time. His work was characterized by a very progressive spirit, and many go so far as to say that he started a new era in Hellenic politics. Among the benefits claimed for the influence of M. Tricoupis are the doubling of the financial resources of the kingdom, the founding of the present railway system, the organization of the police on a military basis, the reform of the military and civil education, the improvement of the administrative service, and the creation of the fleet. M. Tricoupis was several times premier, and it is said that no important organic law of the country was framed independently of him. His rival was M. Delyannis, whose programme was negative and under whom the various elements of opposition were united. After 1890 a part of the followers of M. Delyannis left him to form the so-called Neo-Hellenic party under M. Ralli. In 1895 the Tricoupists were overthrown and M. Delyannis came into power, remaining in office until April, 1897, when the military disgrace of Greece led to his dismissal. Then followed the brief ministry of M. Ralli, which lasted until the close of September, 1897, when it was succeeded by that of M. Zaimis. After the death of Tricoupis his followers determined to continue their party organization on the principle of political reform, and since then they have rapidly gained new adherents. The ministry of M. Zaimis lost popularity, and in the general elections of February, 1899, the Tricoupists won a com-

plete victory under the leadership of M. Theotokis, who, on April 2, 1899, was summoned to form a ministry.

Condition of Greece Since the War.—The chief reason for the triumph of the Tricoupists was the general feeling since the defeat of Greece that political reform was necessary, especially in the civil administration, in the army, and in the department of justice. Following the war there was a sort of interregnum, during which parliament exercised but little power. The chamber, having voted the treaty with Turkey and the convention in regard to the international control of the Greek finances, seemed to have no further work to do and was dissolved. The people, accustomed during thirty-seven years to the parliamentary form of government, were distrustful of this change and of the ministry of M. Zaimis, who was said to have persuaded the king to make the fullest possible use of his prerogatives and conduct the government without the aid of parliament. The electoral contest of February, 1899, expressed plainly the general view on this matter, and resulted in the establishment of the first parliamentary ministry since the war.

The New Chamber.—The ministry of M. Theotokis, formed on April 14, was constituted as follows: M. Theotokis, president of the council and minister of the interior; M. Simopoulo, finance; M. Athos Romanos, foreign affairs; M. Coumoundoros, war; M. Boudouris, marine; M. Carapavlos, justice; M. Eftanias, worship and public instruction. Among the first measures of the new chamber were the ratification of acts enforced by royal decree during the parliamentary interregnum, and the passage of a bill of indemnity for the anti-parliamentary acts of the government. During the session, which lasted until June, the chief work of the chamber was in the domain of administrative reform. The finances received the first attention. There was confusion in the system of imposts, and an imperative need of making up the budget deficit. An interesting feature of the financial changes was the introduction of the system of assessment as practised by western nations. This came about through the levying of a direct tax on vineyards. The next matter that came up was the economic policy of the government. Protection for home industries was advocated. No very extensive protection was demanded, but it was urged that some slight protection for nascent industries would give valuable results. The improvement of agriculture in Thessaly by a better system of drainage and by other agricultural reforms was also advocated in the hope of enabling Greece to raise enough food products for home consumption. Among the other reform measures introduced the following may be mentioned: A provision for the redivision of the country, the establishment of a better system of local self-government, and the substitution for the military police of a police force organized on a military basis, under the direction of the minister of the interior. The chamber discussed the question of responsibility for the war with Turkey, and finally appointed a commission of inquiry to investigate the causes of the war and the responsibility for its results.

GREEK CHURCH in the United States consisted in 1899 of the Greek Orthodox Church, with 5 ministers, 5 churches, and 6000 communicants; and the Russian Orthodox Church, with 40 ministers, 31 churches, and 43,000 communicants.

GREENE, CONYNGHAM, M.A., C.B., British agent to the South African Republic, with the rank of *chargé d'affaires*, left Pretoria upon the outbreak of the war in October, 1899. Born in Ireland October 29, 1854, he was educated at Harrow and at Pembroke College, Oxford, where he took his bachelor's degree in 1877. In this year he entered the foreign office; was acting third secretary at Athens in 1880 and *chargé d'affaires* at Stuttgart and Darmstadt from 1883 to 1887; in 1889-91 he was second secretary at The Hague and in 1891-93 at Brussels. From the latter year to 1896 he was secretary of legation and *chargé d'affaires* at Teheran, and was then transferred to Pretoria.

GREENE, General GEORGE SEARS, died at Morristown, N. J., January 28, 1899. He was born at Apponaug, R. I., May 6, 1801, and in 1823 was graduated from the United States Military Academy at West Point. After serving at various garrisons and as instructor at West Point until 1836, he resigned from the army; having entered the engineering profession, he built many railroads in Maine, Massachusetts, Rhode Island, New York, Maryland, and Virginia. He was on the engineering staff of the Croton Aqueduct Department (New York) in 1856; he built the reservoir in Central Park and the enlargement of High Bridge. In 1862 he entered the Union service as colonel of the Sixtieth New York, and in April of that year was made a brigadier-general of volunteers. At Cedar Mountain he commanded his brigade and at Antietam the second division of the Twelfth Army Corps. In the battle of Gettysburg, having in command the right wing of the Army of the Potomac, he rendered excellent service at Culp's Hill. In September of the same year (1863) he was transferred to the West, and on the 28th of the following month, in an engagement near Chattanooga, received a wound that prevented further service until January, 1865, when he joined Sherman's army in North

Carolina and took part in the engagement against Johnston. In March he was breveted major-general of volunteers. Retiring from the army, he accepted the position of chief engineer and commissioner of the Croton Aqueduct Department, where he served until 1871, when he became chief engineer of public works in Washington, D. C. In 1875-77 he was president of the American Society of Civil Engineers. General Greene was the father of General Francis Vinton Greene.

GREENLAND, an island northeast of North America, is a Danish colony, having an estimated area of 46,740 square miles and a population, as reported in 1890, of 10,516, of whom 309 were Europeans and the rest natives. The capital, so called, is Godthaab, situated on the west coast, not far from the 64th parallel. The interior of Greenland is covered with the ice cap, but parts of the coast in the south and west are habitable. The trade constitutes a monopoly of the Danish government. In 1897 exports to Denmark amounted to 368,000 kroner, and imports from Denmark, 767,000 kroner. The chief exports are whale and seal oil, seal, fox, and reindeer skins, feathers, eiderdown, and cryolite. Reference is made to Greenland in the article ARCTIC EXPLORATION.

GREKOFF, DIMITR PANAJOTOFF, Bulgarian statesman, in January, 1899, succeeded M. Stoiloff upon the latter's resignation as premier, and organized a ministry, in which he took the portfolio of foreign affairs. M. Grekoff was born in 1847 of Bulgarian parents at Bolgrad, in the Russian province of Bessarabia. After studying law in Paris, he settled as an attorney in Roumania; he went to Bulgaria after its liberation, and in 1878 was elected to the national assembly at Tirnova, in which he was one of the leaders of the Conservatives. In 1879-80 and 1882-83 M. Grekoff was minister of justice, and in 1890 he assumed the portfolio of foreign affairs in the Stambuloff cabinet; this position he resigned when the premier resigned in May, 1894. He then resumed his practice of the law, returning to political life in January, 1899. His ministry retired in October, 1899, the succeeding one being formed with M. Ivantchoff as premier. M. Grekoff is said to be the foremost counsel in Bulgaria. See BULGARIA.

GRENADA, an island of the British colony of the Windward Islands (*q. v.*), has an area of about 133 square miles and a population upward of 61,000. It contains the capital of the colony, St. George, population, nearly 5000. The government of Grenada is directed by the governor of the colony and by an executive and a legislative council. Its products include cacao, fruits, coffee, cotton, and spices. In 1897 the cacao export amounted to £132,642; spice, £13,503. The following statistics are for Grenada, together with the Grenadines, and relate to 1898. Exports: Cacao, £227,654; nutmegs, £19,740; mace, £2344; total exports, £257,274; total imports, £210,783. Revenue, £62,875; expenditure, £57,612; public debt, £127,670. The aggregate entrances and clearances in foreign shipping in 1897 amounted to 443,808 tons.

GRENADINES, a group of small islands, included in the British colony of the Windward Islands (*q. v.*), and lying between St. Vincent and Grenada, have an area of 8462 acres, or a little more than 13 square miles, and a population of about 6400. Some of the Grenadines are subordinate to St. Vincent and some to Grenada. All but a few hundred of the inhabitants live on the largest island, Carriacou, which is about seven miles long and has an area of ten square miles.

GRIER, WILLIAM MOFFATT, D.D., LL.D., president of Erskine College, Due West, S. C., died in Columbia, September 3, 1899. He was born in York County, S. C., February 11, 1843; in 1860 he was graduated at Erskine. In the Civil War he served as a private with the Sixth South Carolina Volunteers and lost a leg in the battle of Williamsburg. Subsequently he became a minister in the Associate Reformed Presbyterian Church, and from 1871 to the time of his death was president of Erskine College; here also he occupied the chair of mental and moral philosophy, and in the Erskine Theological Seminary he was professor of pastoral theology and homilectics. Dr. Grier was editor of the *Associate Reformed Presbyterian*.

GRIFFITH, ARTHUR F., a new arithmetical prodigy, attracted the attention of the scientific world in December, 1899, through the efforts of Professors E. H. Lindley and W. L. Bryan, of the University of Indiana. The present case is more than a mere curiosity, as he has been subjected to psychological investigation. This has been done in the case of only two rapid calculators before the present. M. Binet, of Paris, made a scientific investigation into the mental development and methods of Inaudi and Diamandi. The new American calculator is a youth nineteen years old by the name of Arthur Frederick Griffith, born in Milford, Kosciusko County, Ind. His father is a stone mason in poor circumstances. He is the eldest of six children, and began at an early age to exhibit signs of his present extraordinary facility with numbers. His mother could keep him still when a very young child

by getting him to count the various objects in the room, and this habit of enumeration gradually extended to counting for three succeeding summers the number of grains of corn fed to his father's chickens. There has been no very great aptitude for figures displayed by any of his ancestors or relatives as far as is known, nor has there been any mental or physical abnormality (with one slight exception) in himself or in his family. He was sent to the public school at the age of ten years, and continued there for seven years, making a good record in all studies, but astonishing his teachers by his wonderful command of numbers. His mathematical education went no higher than arithmetic. His progress in that branch will be appreciated when it is said that his teachers used to employ him to write on the blackboard perfect squares and cubes of numbers for the other pupils of his class to find the roots of. He began when twelve years old to invent short cuts in arithmetic for doing certain sums, a method which he has carried very far, and to which largely he owes his wonderful results. He was brought to the psychological laboratory of Indiana University in November, 1899, and Professors Lindley and Bryan made a careful examination of his physical and mental state, finding his nerve signs, his sensory and motor abilities normal. His memory for figures is extraordinary. He recalls 21 digits after a single hearing. His memory is not much above the normal in ordinary psychological retentiveness, but is systematic and highly trained in certain lines. He knows the multiplication table up to 130 by 130, and gradually increases this by remembering for months the problems given him. He has memorized the squares of all numbers up to 130, the cubes of all up to 100, the fourth powers up to 20, the fifth powers of many numbers, and all the powers of the numbers 2 and 5 up to and including the thirty-third power. He is one of the most rapid calculators on record, multiplying two-place figures in a second and a half, and a four by a three-place number in $3\frac{1}{2}$ seconds. He adds three columns of figures as quickly as an expert accountant, and extracts the square root of six-place numbers in about five seconds, and the cube root of nine-place numbers in a slightly longer time. His methods, which have been studied by Professors Lindley and Bryan, show that he has an extraordinary originality, anticipating many of the methods of higher mathematics and making discoveries of his own about the relations of numbers. He has fifty short methods of multiplying, some of which, though he never studied algebra, approximate the binomial theorem; he has six abbreviated methods for adding and the same number for dividing. One of his short cuts is illustrated by the fact that he raises 991 to the fifth power in 13 operations, a multiplication which ordinarily requires 339 operations. A further study of Griffith and his methods is in progress, and it is thought that it will be of great value, not only to psychology, but to mathematics as well. Griffith was exhibited before the annual meeting of the American Psychological Association at New Haven, Conn., December 27 and 28, 1899.

GRIPPE, LA. See INFLUENZA; PSEUDO-INFLUENZA; THERMOL; VITAL STATISTICS.

GRONLUND, LAURENCE, a socialistic writer, died in New York City, October 15, 1899. He was born in Denmark, July 13, 1846, and was graduated at the University of Copenhagen. Having come to America, he gained some prominence in the Socialist party; he made a tour through the West, lecturing on socialism, and in the State of Washington became the editor of a Socialist paper. Subsequently returning to the East, he secured a position under Mr. Carroll D. Wright, United States commissioner of labor statistics, in Washington, where he is said to have done much of the work upon the statistical reports. Shortly before his death he became engaged in editorial work in New York. He wrote: *The Co-operative Commonwealth*, which appeared before Henry George's *Progress and Poverty*; *Ca Ira, or Danton in the French Revolution*; *Our Destiny*; *Socialism and the Single Tax*; *The New Economy*, 1898.

GUADELOUPE, a French colonial possession in the Lesser Antilles, consists of two islands, Basse-Terre and Grand-Terre, separated by a narrow channel. Their area, together with five smaller dependent islands, is 583 square miles, and the population is about 167,000, of which 15,000 are coolies. The principal town and seat of government is the port Pointe-à-Pitre (population, 17,100). The colony is represented at Paris by a senator and two deputies and is administered by a governor and an elective council. There is a lyceum with 350 students and 97 elementary schools with about 11,000 pupils. In 1898 the public debt was 1,000,000 francs, and the local budget balanced at 5,774,564 francs; the expenditure of France in the budget of 1899 was 1,627,637 francs. The leading products are sugar, coffee, and cacao; other crops, chiefly for local consumption, are bananas, maize, tobacco, sweet potatoes, manioc, etc. About 62,760 acres are under sugar culture. In 1896 the exports to France amounted to 13,085,051 francs and the imports from France, 11,287,915 francs. Steam vessels of two companies ply between Guadeloupe and France and England. The total exports and imports in the following year amounted

to 9,909,038 francs and 15,034,901 francs, respectively. In the spring of 1899 a series of riots took place in Guadeloupe between the Hindu contract laborers and the French Creole laborers, and on April 17 over 400 houses were set on fire in Pointe-à-Pitre. The estimated loss was \$1,000,000. The riots continued, and the local authorities being unable to restore order, the British counsel appealed to his government for the protection of the interests of British subjects in the island. On August 7, 1899, a hurricane caused great damage to houses, crops, and shipping, while forty deaths and over two hundred persons injured were reported. The loss of property amounted to at least \$5,000,000. The western part of the island suffered least, but on the east the towns of St. François, Bertrand, Ause, Port Louis, Gosier, and the Moule were almost totally destroyed. The disaster coming so soon after the earthquake of 1897 and the serious fires in 1898 and 1899, while at the same time there was a financial crisis, threatened the island with famine, and it was thought that the colony might be forced to appeal to the outside world for help.

GUAM is the largest and most southern of the Ladrone (*q. v.*) or Marianne Islands, a group of about fifteen small islands discovered by Magellan in 1521. Guam is about 30 miles long and from 3 to 12 miles broad, with an approximate area of 150 square miles, and a population now estimated at about 9000. It lies 1350 miles south of Yokohama, about 1500 miles east of the island of Luzon in the Philippines, and a little over 5000 miles west of San Francisco. It is of little value in itself, but as it will probably be used as a coaling station by the United States, it is important on account of its relative position and the fairly good roadstead which it possesses. The harbor of Apra has already been charted, and the channel marked by the American government. There is also the Bay of Umata, where there is a town of 200 people, and Agaña, the capital, with a population of about 3000. The latter has been fortified by the Spaniards. The only product of any importance is copra, which is exported to some extent. The island, especially in the southern part, is reported to be quite fertile, but although half its area has been estimated as susceptible of cultivation, a very small percentage has been thus utilized. A small amount of rice, sugar, and vegetables, and cocoanuts, oranges, and lemons are grown. In regard to the fauna of the island, deer and wild goats abound, and are, with the species of bat known as "flying foxes," among the staple articles of food. Guam was peacefully captured in June, 1898, by the United States steamer *Charleston* en route to the Philippines, and on December 23 the *Bennington* (under Commander Taussig) was ordered from Honolulu to Guam, and early in the following year the American flag was raised over the government buildings, and Commander Taussig took formal possession. Later in the year Captain Richard P. Leary, U.S.N., was appointed governor-general of Guam. During the year he instituted many reforms, and made himself popular among the simple inhabitants, while occasioning considerable interest and amusement in this country by the unique methods by which he sought to Americanize the island. He prohibited slavery, drove from the island two friars whose methods he found to be corrupt, established proper customs duties, and requested that the War Department send additional tools, medical supplies, and other stores, and also an ice machine. He also asked for musical instruments and a library. He prohibited polygamy and concubinage, which were general, and ordered all offenders to marry at once. All persons who were following no trade were expected to plant corn, rice, and other vegetables, and to keep twelve hens, one rooster, and one sow. The paternal government instituted by Governor Leary has apparently met the needs of the situation. Drunkenness and indolence, two native characteristics, have been corrected, and the schooling of the children has been instituted. The usual Spanish neglect of sanitary conditions having prevailed in Guam, typhoid fever was prevalent when Governor Leary took charge. At the present time a water distillery has been constructed, and a pure natural supply of water is being planned for.

GUATEMALA, the most northern and western republic of Central America. The capital is Guatemala la Nueva.

Area and Population.—The country consists of 22 departments, the total estimated area of which is about 125,100 square kilometres (48,225 square miles), and the population (1897), 1,535,632. Very few of the inhabitants, except in the cities, are of pure European descent, about 60 per cent. being Indians, and the greater part of the remainder mestizos. Of the births among the whites about one-fourth and among the Indians about one-half are illegitimate. Besides the capital the principal towns are Totonicapam, Coban, Quezaltenango, and San Pedro.

Government.—According to the constitution, the executive authority rests with a president, elected for six years, and ineligible for the ensuing term, who is assisted by a cabinet, the members of which manage the departments of government and justice, foreign affairs, war, hacienda and public credit, public instruction, and fomento.

The president is Señor Manuel Estrada Cabrera, who, as vice-president, assumed the executive functions upon the assassination of President J. M. Reyna Barrios in February, 1898; in the following September Señor Cabrera was elected for a full term as president. The legislative power devolves upon a national assembly, the members of which are chosen by popular vote for terms of four years in the proportion of one representative for each 20,000 inhabitants. Besides justices of the peace in the municipalities, there are 26 courts of first instance, 6 appellate courts, and a supreme court.

Army.—The effective army consists of men from eighteen to thirty years old, and is said to number 56,000; besides this there is a reserve of about 30,000 men between thirty and fifty years of age. The regular or standing army numbers about 7000 men. About one-tenth of the total public expenditure is for the maintenance of the army.

Finance.—The revenue is derived chiefly from customs and taxes on alcoholic liquors and tobacco; nearly three-fourths of the expenditure is for the public debt, war, and public instruction. The revenue and expenditure for 1896 were 15,150,741 pesos and 17,437,452 pesos respectively; the revenue for 1897 and 1898 (estimated) is reported at 12,479,741 pesos and 11,565,000 pesos respectively. Of the latter 3,926,000 pesos was from customs and 3,224,000 pesos from liquors. At the beginning of 1898 the public debt, including the foreign debt of 18,443,600 pesos, amounted to 40,185,424 pesos, against which the government showed assets valued at 17,383,513 pesos. The currency is chiefly paper. There are six banks of issue. The value of the peso in United States currency on October 1, 1899, was \$0.436.

The financial condition of the country in 1899 was very unsatisfactory. The currency is depreciated, and the distress was aggravated by the great falling off in the price of coffee. The financial strain borne by the government was seen in the early part of July, when, though greatly arousing the discontent of foreign creditors, President Cabrera ordered an extension of time until October for the settlement of accounts against the government. It was also rumored that the government was actually considering the repudiation of some of its foreign bonded debt. This called forth much hostile feeling in Great Britain and Germany, which nations for a time were expected to send four warships to the Guatemalan ports. During the stringency revolutionary plots were prevalent. Toward the close of 1899 the Guatemalan consul at Hamburg, Germany, reported that his government had successfully negotiated a foreign loan of \$15,000,000.

Industries.—The national land law enacted in 1894 provided for the survey and division of state lands for allotment to settlers, the maximum amount allowed to one person being 15 caballerias (1687.5 acres). According to their productive value, the price of these lands varies from 250 pesos to 500 pesos a caballeria. The government reserves a strip of land 1500 metres (nearly a mile) in width on the coast, and 200 metres in width on the banks of navigable rivers; these lands, however, may be leased provisionally. Lands bordering on the frontiers may be acquired only by citizens of Guatemala. The government grants uncultivated lands gratuitously to municipalities, to educational institutions, to recently established villages, to immigrants and companies promoting immigration, and to persons undertaking the construction of national roads.

Agriculture is the chief industry, and coffee the principal crop. The leading coffee-producing districts are in Alta Verapaz, Chimaltenango, Esquintla, Quezaltenango, Retalhuleu, San Marcos, Santa Rosa, and Zacapa. About two-thirds of the export is sent to Germany. The cultivation and export of bananas is increasing; the fruit grows best on the Atlantic side of the country, and the export trade is confined to the southern ports of the United States. In 1893 the shipments amounted to 364,851 bunches; since that time the trade has increased, but definite statistics are not obtainable. Tobacco also is grown in the eastern part of the country; the culture covers about 2500 acres, yielding 2,250,000 pounds. In 1899 a law taking effect July 1 was promulgated, declaring that tobacco culture be free from tax, national or municipal. Maize is one of the staple crops, but is not exported. Cacao is grown in small quantities; it is the most valuable kind on the market, the price, even in Guatemala, being 50 per cent. greater than for other cacao. Other products include hides, rubber, and sugar. In 1899 the government took measures for encouraging the cultivation of the rubber tree. Various metals and other minerals are found, but hitherto have been little exploited; among them are gold, silver, copper, lead, tin, salt, and sulphur. There are a number of factories, some of them fairly prosperous, for cotton and woollen goods, the preparation of the grass-cloth plant, furniture, earthenware, etc., besides foundries, breweries, and distilleries, and sugar mills.

Commerce and Shipping.—The foreign trade is chiefly with the United States, Great Britain, and Germany. In 1894 imports came from these countries in the following proportions: United States, 26 per cent.; Great Britain, 24; Germany, 13. In 1896 the percentages were: United States, 34; Great Britain, 23; Germany, 22;

and in 1898, United States, 34; Germany, 24; Great Britain, 18. For 1896 the imports and exports amounted to 26,287,145 pesos, and 23,085,544 pesos respectively; for 1897, imports, 21,462,053 pesos, and exports, 19,775,800 pesos. The reported values of imports and exports for 1898 were about 22,320,000 pesos, and 19,641,000 pesos respectively. In 1896 the coffee export was 68,572,634 pounds, value 22,349,623 pesos; in 1897, 82,475,586 pounds, but though the quantity was much greater than in 1896 the value was but 18,875,700 pesos. Of the crop of 1896, 44,268,079 pounds, and of that of 1897, 54,380,672 pounds went to Germany. Among the chief imports are cottons, cereals, alcoholic liquors, iron goods, and woollens. The tonnage entering the Guatemalan ports in 1897 aggregated 782,076 tons, carried in 614 vessels, most of which belonged to the United States.

Communications.—There are a number of good roads in Guatemala, but much traffic is still effected by pack mules. Railroad construction progressed in 1899. There is a line connecting the capital with Iztapa, one connecting the capital with San José on the Pacific coast and passing through Esquintla (85 miles), one between Champerico on the Pacific and Retalhuleu (32 miles), and one still shorter between Retalhuleu and San Felipe. The Puerto Barrios and Northern Railway was projected a number of years ago from a point on the Gulf of Amatique, along the Motagua River to Guatemala city and thence to San José, a total distance of about 230 miles. In the spring of 1899, when only 59 miles remained to be built, it was reported that the government had sold the road to an American company. It is expected that this road will divert much of the coffee traffic from the Pacific routes to the gulf ports of the United States. Upon the completion of this road there will be about 450 miles of railway in operation. In 1897 there were reported 3093 miles of telegraph lines, with 171 offices and 272 post-offices.

Religion and Education.—There is no state church and the principle of religious toleration is recognized, though Roman Catholicism is dominant. Education is gratuitous and nominally compulsory. The number of primary schools under government control in 1895 was reported at 1266, with an attendance of 64,015 pupils. The private schools for primary and secondary instruction numbered 49. There were 13 schools for special or professional instruction, and 6 normal schools and institutes. The government expenditure for education in that year was 95,062 pesos. In 1896 there were published 37 periodicals, of which 7 were dailies and 14 weeklies.

A Revolutionary Attempt.—A revolutionary movement culminated on December 14, 1899, when the insurgents captured the town of Tacona in the state of San Marcos and near the Mexican border. The insurrection, however, was soon suppressed, the government troops surrounding the town and capturing nearly all of the rebel leaders.

GUÉRIN, EUGÈNE, French politician, was born at Carpentras, July 27, 1849. After studying law in Paris he took part in the Franco-Prussian war of 1870-71, after which he settled as an advocate in Carpentras, and later became mayor of that town. He was elected to the senate in 1890, and from April, 1893, to the following December, and from May, 1894, to January, 1895, was minister of justice in the cabinet of M. Charles Dupuy. For an account of his siege in the Rue Chabrol, see FRANCE (paragraphs on History).

GUILLOU, CHARLES F., surgeon, U. S. N., retired, died in New York January 1, 1899. He was born in Philadelphia July 26, 1813; was graduated at University of Pennsylvania. He was surgeon on the *Peacock* in the Wilkes expedition, the first American expedition to the Polar seas. He served in the Mexican War; in 1854 took charge of a hospital in Honolulu, where he acted as Italian consul, and was court physician.

GUZMAN-BLANCO, ANTONIO, ex-president of Venezuela, died in Paris, France, July 29, 1899. He was the son of the once well-known statesman, Leocadio Guzman-Blanco, and was born in Caracas in 1829. While still a young man he gained some prominence in politics, and the usual revolutionary disturbances, and in 1863 became vice-president of the republic. During the Civil War of 1866-67 he fought with the federalists under General Falcon. In 1868 he was forced out of office, and anarchy again threatened the country; he headed a successful revolution, and in April, 1870, became provisional president. It was three years before order could be well established throughout the country, and during this time Guzman-Blanco, supported by the congress, ruled with dictatorial power, but was so successful in introducing beneficent reforms that, in February, 1873, he was elected as regular president for a term of four years. This period was one of the happiest in the history of Venezuela, though the president's dictatorial policy continued, and he amassed great wealth by very questionable methods; nevertheless, he improved the public credit, increased the revenues, established closer relations with European powers, founded schools for both the whites and the Indians, established museums and academies, built canals, opened the first railroad in the country, effected various

municipal improvements, and introduced a new code of law. On February 20, 1877, he was succeeded as president by Señor Alcantara, whose administration was so unsuccessful that strong party strife arose; a revolution followed, which, on May 12, 1879, again made Guzman-Blanco provisional president. At this time he was in Paris, whence he hastened, and was greeted with enthusiasm. In a few months he had restored order. He retired from the office in 1884, being succeeded by Joaquin Crespo, but two years later was again chosen president of the republic; he resigned on August 10, 1887, and went to Paris as envoy to the European powers. In 1889 he was practically deposed by the congress on account of alleged corrupt contracts made in Paris. He erected in Venezuelan cities, it is said, many statues commemorative of his virtues; but these embodiments of his vanity have been torn down.

GYMNASIA, MUNICIPIAL. See MUNICIPAL GYMNASIA.

GYMNASTICS. Gymnastics have become specialized, from the all-embracing gymnasia of the ancient Greeks, which covered more nearly our modern field of athletics, to exercises for the purposes of building up and maintaining the health of the individual, and to contests on certain specified pieces of gymnasium apparatus, as the rings and the horizontal bar. The first department of gymnastics, physical exercise, is found to-day among the enforced curricula of many American schools and colleges, and to a still greater degree among the educational institutions abroad. In the case of gymnastics as relating to contests, far less attention has been paid to them in this country than to the athletic games which have sprung from them, but their number is annually increasing. In 1899 the first important intercollegiate gymnastic association meeting was held, the result being as follows: Horizontal bar, E. B. Turner, Princeton, and R. G. Clapp, Yale, tied, 12 points; side horse, F. J. Belcher, New York University, 10½; parallel bars, R. G. Clapp, 12¼; flying rings, R. G. Clapp, 11½; club-swinging, R. G. Clapp, 13½; tumbling, W. L. Otis, Yale, 10; all-around championship, R. G. Clapp, Yale, 7½ points. Delegates from Princeton, Yale, Union, New York University, Haverford, Amherst, and Columbia met in November and formed a permanent Intercollegiate Gymnastic Association. The first regular championship meeting will probably be held for 1900 at Columbia. Word was received that Harvard and Pennsylvania would also be represented in the association. The general amateur championships for 1899 were won as follows: Horizontal bar, C. Berndt, Anchor Athletic Club; side horse, J. F. Bessinger, New York Turn-Verein; parallel bars, O. Steffen, New York Turn-Verein; flying rings, C. Berndt; club-swinging, F. Metz, Jr., Newark Young Men's Christian Association; tumbling, George Stefer, Pastime Athletic Club; long horse, O. Steffen, 39½ points; rope-climbing, 22 feet from floor, E. Kanuth, Anchor Athletic Club, 6¾ seconds; all-around championship, O. Steffen, 16½ points.

GYPSUM. The production in the United States for the last two years was, 1897, 288,982 short tons, valued at \$753,864; 1898, 291,638 short tons, valued at \$755,280, the latter being the largest known. The important producing States in the order of their output, are: Michigan, Iowa, Kansas, New York, and Texas. Over 80 per cent. of the domestic production is now used for plaster of Paris, and its application for this purpose is increasing. The imports showed a total value of \$240,844. The United States still remains the second producer in the world, the total production of the latter amounting to \$4,015,502. Among the recent developments was the discovery of gypsum near Panasoffkee, Fla. An important report, issued by the Kansas Geological Survey, treats of the Kansas deposits of gypsum and its technology.

GYPSY MOTE. See ENTOMOLOGY (third paragraph).

HADLEY, ARTHUR TWINING, M.A., LL.D., thirteenth president of Yale University, was elected to his present position by the Yale corporation on May 25, 1899, to succeed President Timothy Dwight, whose resignation, tendered on November 17, 1898, was to take effect July 1. President Hadley is the son of James Hadley, for many years professor of Greek at Yale, and was born in New Haven, April 23, 1856. He prepared for college at the Hopkins Grammar School, New Haven, and having entered Yale, was graduated in 1876. Here he continued his work for a year, specializing in political science, and then passed two years at the University of Berlin, studying history and political and economic science. Having returned to the United States, he was a tutor in various subjects at Yale from 1879 to 1883; the next three years he lectured at the university on railroad administration. It was in about 1883 that he began his study of the history and science of railroad transportation, in which subject he has come to be recognized as an authority. As commissioner of labor statistics from 1885 to 1887, Professor Hadley published two reports that have been highly regarded by students of labor problems. During the next two years he acted as associate editor of the *Railroad Gazette*, New York, his special work being the direction of the department of foreign railways. From 1886

to the time of his election to the presidency in 1899 he was professor of political science in the graduate department at Yale, and during the absence of Professor William G. Sumner, from 1891 to 1893, he took charge of the latter's work in the academic department. In 1899 he was president of the American Economists' Association. Professor Hadley's writings, which have insured him a prominent place in the foremost rank of contemporary economists, include the following: A series of articles on *Transportation* in *Lalor's Cyclopædia of Political Science*, 1883; *Railway Transportation: Its History and Its Laws*, 1885; the labor reports of Connecticut for 1885-86 and 1886-87; a part of the article on *Railways* in the *Encyclopædia Britannica*, 1886; the chapter on the business relations of railways in *Scribner's American Railways*, 1888; *Economics: An Account of the Relations Between Private Property and Public Welfare*, 1896. The last-named book is his most important work, *Railway Transportation* ranking second. Dr. Hadley was inaugurated as president of the university on October 18, 1899. His address was "marked by the courage of an assured leadership and high purpose that feared to face no problem squarely, but also no less by loyalty to a noble Christian past."

HAGUE CONFERENCE. The famous circular issued by the Russian court on August 12-24, 1898, inviting a conference to consider the question of gradual disarmament and the maintenance of peace was described in the preceding YEAR BOOK. It was received with scepticism in certain quarters and with indifference or suspicion in others. In the first place, many thought that the idea of a limitation of armaments, not to say gradual disarmament, was purely visionary. In the second place, some took the pessimistic view that the Czar's proposal might even result in bringing about the very thing that he aimed to avoid—namely, a general war. But as time went on it came to be the general opinion that the conference would certainly do no harm and might do some good, although it would fall far short of what its authors hoped for it.

In a second circular issued by Count Muravieff, January 11, 1899, the Czar's proposals respecting disarmament and the maintenance of peace were more definitely stated. This circular requested a conference which should discuss the following points:

"1. An understanding not to increase for a fixed period the present effective of the armed military and naval forces, and at the same time not to increase the budgets pertaining thereto; and a preliminary examination of the means by which a reduction might even be effected in future in the forces and budgets above mentioned.

"2. To prohibit the use in the armies and fleets of any new kind of firearms whatever and of new explosives, or any powders more powerful than those now in use either for rifles or cannon.

"3. To restrict the use in military warfare of the formidable explosives already existing, and to prohibit the throwing of projectiles or explosives of any kind from balloons, or by any similar means.

"4. To prohibit the use in naval warfare of submarine torpedo-boats or plungers, or other similar engines of destruction; to give an undertaking not to construct vessels with rams in the future.

"5. To apply to naval warfare the stipulations of the Geneva Convention of 1864, on the basis of the articles added to the convention of 1868.

"6. To neutralize ships and boats employed in saving those overboard during or after an engagement.

"7. To revise the declaration concerning the laws and customs of war elaborated in 1874 by the conference of Brussels, which has remained unratified to the present day.

"8. To accept in principle the employment of the good offices of mediation and facultative arbitration in cases lending themselves thereto, with the object of preventing armed conflicts between nations; an understanding with respect to the mode of applying these good offices, and the establishment of a uniform practice in using them.

"It is well understood that all questions concerning the political relations of states and the order of things established by treaties, as generally all questions which do not directly fall within the programme adopted by the cabinets, must be absolutely excluded from the deliberations of the conference."

This basis for discussion was generally accepted, but when it came to issuing the invitations some difficulties were encountered. The United States had already revealed its unwillingness to commit itself to a continuance of the present status, in view of the smallness of its military and naval forces as compared with those of European states. Italy opposed the representation of the papacy in the conference, and Great Britain opposed that of the Transvaal. These objections were sustained, and the invitations were not extended either to the Pope or to the government of the Transvaal. It was appointed that the conference should meet at The Hague on May 18. Invitations were issued by the Dutch government to nineteen European

states, and to the United States, Siam, Persia, Japan, and China. Including Russia, there were twenty-six states represented at the conference, thus comprising a majority of the minor powers. The South American states, however, were not represented, it being assumed that the United States would be their spokesman. The meetings of the conference were held in the Palace in the Wood (*Huis ten Bosch*), about two miles from the centre of The Hague.

The Delegates.—The American delegates were Andrew D. White, United States ambassador to Germany, who was the head of the delegation; Stanford Newel, United States minister to the Netherlands; Captain William Crozier, of the Ordnance Department of the United States Army; Captain A. T. Mahan, of the navy (retired); Seth Low, president of Columbia University, and Frederick W. Holls, of New York, the last named being the secretary of the delegation.

A striking fact in regard to the conference was the complete change in the character of the original programme. In the circular letter of August 24 the limitation of armaments or their progressive reduction was the principal feature, while matters pertaining to arbitration and mediation were altogether secondary. By the time the conference met this order was completely reversed, as appears from the speech which Baron de Staal, the chief delegate from Russia and the president of the conference, made on May 20. In this arbitration and mediation play the principal part. It was to these especially that the attention of the delegates was invited. After this they were requested to consider plans for mitigating the horrors which are inseparable from war when war has once broken out; and not till toward the end of the speech was anything said on the subject of disarmament, which was disposed of in these few words: "It is worth while, moreover, to ask if the welfare of the people does not require the limitation of progressive armaments. It behooves the governments in their wisdom to adjust in this respect the interests with which they are charged." Thus, it was evident from the first that if the peace conference accomplished anything, it would be by way of facilitating arbitration and mediation, which were the main objects of its attention. Even within this limited sphere many feared that the conference would fail. The chief obstacle, it was thought, was the importance of rapid mobilization as an element of success in modern warfare. It was predicted that those powers which, like Germany, were able to mobilize large forces quickly would refuse to submit an important matter to arbitration, since they would thus give the hostile power a chance to perfect its mobilization while the arbiters were in conference and so deprive its better equipped foe of its advantage. It might be decided to prohibit either party from beginning mobilization until the arbiters had decided that they could not adjust the matter in dispute; but this was not only difficult in practice, but was thought by some to be inadmissible in law. Again, the arguments of Baron de Staal in favor of arbitration were scouted by some as wholly Utopian. He said, for instance, that between nations there existed a community of material and moral interests, and that even should a nation desire to remain isolated, it could not do so. On the other hand, the reality, as judged by historical events, did not seem to correspond to this theoretical conception, for not only have wars often profited the conqueror, but they have indirectly benefited third parties to such an extent that outside nations have frequently tried by secret means to involve others in war. The scepticism in regard to the results of the conference was most marked in France and Germany. Many writers for the continental press were so convinced of the futility of the conference that they even began to impute blame for its failure in advance. In Germany it was said that France would be the chief obstacle to the realization of the Czar's project, since France was too thoroughly possessed with the idea of revenge for Alsace-Lorraine. On the other hand, the French thought that Germany would be the stumbling-block, and it was noted that the Emperor William in his famous speech at Porta Westphalica had said that the best guarantee of peace was a strong army, and implied that Germany was not disposed to think seriously of disarmament. They also noted that the delegate whom William II. chose to represent Germany in the conference was Baron de Stengel, professor of law at the University of Munich, who a short time before had published under the title of *Eternal Peace* a brochure, in which he had ridiculed the idea of disarmament. In short, very little was expected to result from the conference, which at best was regarded as an evidence of the amiable wishes of the Czar.

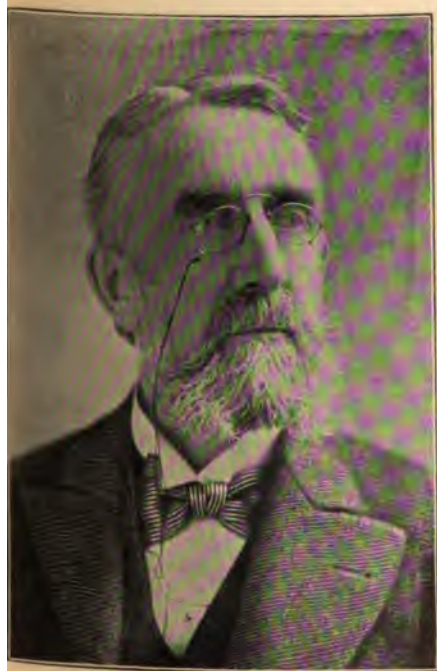
Mediation and International Commissions of Inquiry.—The most important work at the conference was that of the committee organized to consider the regulation of international conflicts. M. Léon Bourgeois, chairman of the French delegation, was president of this committee. Its members, appointed by him, were Count Nigra (Italy), Sir Julian Pauncefote (Great Britain), Baron d'Estournelles de Constant (France), Asser (Netherlands), Chevalier Descamps (Belgium), Holls (United States), Lammasch (Austria), De Martens (Russia), Odier (Switzerland), and Dr. Zorn (Germany). The Russian proposal was submitted on May 22 and the



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HAGUE.—1. Count Von Münster, head of the German Delegation. 2. M. Léon, head of the Italian Delegation. 4. M. De Staal, Russian Ambassador in London. 5. General Adna R. Chaffee, United States Army. 6. Andrew D. White, United States Senator. 7. Captain Alfred T. Mahan, United States Navy (retired).

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debate began a week later. The first topic discussed was mediation as preliminary to arbitration. This principle was not altogether a novelty in international affairs. The treaty of 1856 had contained a clause that if disputes arose between the Porte and one of the signatories, the Porte or some of the other powers should try mediation before having recourse to arms. The same principle was followed at the convention of the Berlin Conference, February 26, 1885, defining the limits of the Congo Basin. It was here again provided that, in the event of a dispute between the signatories of the convention, mediation should be attempted before recourse was had to arms. The important thing in the Russian proposal, however, was that when disputes arose between civilized states the powers which were not involved should offer their good offices or mediation, in order to remove, if possible, the existing differences and to propose an amicable solution. Thus, a state involved in a controversy with another state would not have to apply for mediation, the other powers offering it of their own free will, nor could this act of intervention be regarded as an unwarrantable interference. It was the object of the Russian proposal to establish the practice of such intervention so that it would be regarded as a matter of course and in nowise indicative of a hostile or meddlesome spirit.

Still further to strengthen the cause of peace, it was provided in the Russian proposal that there should be international commissions of inquiry (*commissions internationales d'enquête*) whenever a dispute arose between any of the signatory powers which could not be adjusted by the ordinary diplomatic means, but in which neither the honor nor the vital interests of the conflicting states were involved. The governments concerned should establish an international commission of inquiry in order to subject the points at issue to an impartial examination. Each government should name two members, and these four members should meet and choose a fifth. The object of this commission would be to bring out the truth and to make a report, which report was not to be binding upon the parties to the dispute. The mind of the committee was divided on the subject of these proposals. Some of the states tried to weaken their force by rendering them more vague and elastic, while others sought rather to strengthen them. But after some discussion the clause relating to mediation on the initiative of other powers was voted, with the additional phrase, "in so far as circumstances admit." The opposition to the establishment of commissions of inquiry was more determined. It was objected by some that this arrangement threatened the independence of the smaller states, while others held that it was altogether too much in favor of the smaller states. Some said that it would lead to obligatory arbitration and others that it would prevent arbitration altogether. The main point at issue was the obligatory character requiring the interested parties to institute an international commission of inquiry, and at length it was proposed that the clause should merely state that the signatory powers judged it advisable that these commissions of inquiry should be appointed. This proposition was discussed before the whole conference, but it did not meet with the approval of the representative from Roumania, who demanded a more radical wording. The original wording of the clause was finally retained, but modified by the proviso that the dispute should involve neither the honor nor the essential interests of the powers concerned, and that the international commission should be appointed in so far as circumstances permitted. It was made perfectly clear that the report of the commission was confined to the determination of the facts and that it left the parties to the dispute entirely free to accept or reject its decision. An important addition was made to the original project of mediation by the American representative, Mr. Holls. He argued that, as in private life on the eve of a duel the seconds are left to discuss the various points and questions in connection with the affair, in the event of an international controversy the states in dispute should be encouraged each to choose another power as a second, and that the two powers thus chosen should meet and discuss the points at issue. Mr. Holls explained that the effect of this arrangement would be to prevent any change in the subject-matter of the dispute, and it would also really continue diplomatic intercourse. The proposal was adopted in the following form: The signatory powers voluntarily recommend the application, in so far as circumstances permit, of a special mediation under the following form: In case of a serious difference compromising the peace, the conflicting states should each choose a power to which it would intrust the mission of entering into direct relations with the power chosen by the other party, in order to prevent the rupture of peaceful relations. So long as this mandate continues, whose term, except for stipulation to the contrary, must not exceed thirty days, the states in dispute should cease all direct discussion of the point at issue, which is considered as given over exclusively to the mediatory powers. These should make every effort to compose the differences. In case of a complete rupture of the peaceful relations these powers should continue charged with their common mission of taking advantage of any chance to restore peace.

So much for mediation and the establishment of the international commissions

of inquiry. It will be seen that nothing in the shape of obligatory arbitration has been established. The direct mediation of the other powers and the founding of the international commission are purely facultative; but although they have no binding force, there is no doubt that they will tend to prevent war. Before the conference a power was entitled to offer its good offices and mediation, but the offer had not the same sanction of international approval that the conference has given to it. When a power now offers its mediation, it does so in the name of a large part of the civilized world.

International Arbitration.—On the subject of international arbitration, properly so called, the Russian proposals were very far-reaching. While they recognized that matters involving the honor or dignity of nations were not fit subjects for arbitration, they aimed to render arbitration obligatory in a great number of specified cases which did not touch the honor or vital interests of states. After some discussion, in the course of which a number of alterations were made, the substance of these proposals was as follows: Arbitration to be obligatory in the following cases in so far as they do not touch the honor or the vital interests of the powers. (1) In disputes arising from matters relating to pecuniary claims. (2) In disputes over the interpretation or application of conventions relating to posts, telegraphs, and telephones; conventions relating to the protection of submarine cables; conventions concerning railway transportation; conventions and rules having to do with the prevention of collisions at sea; conventions concerning aid to the sick and wounded in time of war; concerning the safeguarding of literary, artistic, and industrial property, including patents and trade-marks; concerning the system of weights and measures; concerning mutual aid for the infirm and dependent; sanitary conventions; conventions for the prevention of the cattle plague and phylloxera; extradition conventions; conventions of delimitation in so far as they are technical and not political in character. The debate on these proposals showed remarkable unanimity among the delegates, and for the moment it seemed as if the principle of obligatory arbitration would be admitted on all these points. This was prevented by the attitude of the German delegate, Dr. Zorn, who suddenly announced that Germany did not accept the principle of obligatory arbitration, except in so far as certain treaties into which she had entered had already accepted that principle. As a result of the discussion, the word obligatory was struck out, and it was said merely that arbitration was recognized as the best means for settling the differences above mentioned, and that it was recommended. Thus, the commission confined itself to recommending international arbitration as the most effective and most equitable means of settling disputes. It was added, however, that, independently of general and particular treaties which actually stipulate that it shall be compulsory for the signatory powers to have recourse to arbitration, these powers reserve for themselves the right of concluding, either before or after ratification of the act of the convention, any new agreement, general or particular, with a view to extending the principle of obligatory arbitration to all the cases to which they judge it applicable.

A more important work was accomplished at the instance of the British representative, Sir Julian Pauncefote, in the establishment of a permanent court of arbitration. Sir Julian proposed that there should be established in some European city a central bureau which should receive applications for the calling together of the court of arbitration, at the request of the parties in dispute, and that it should keep the records of that court. This central bureau should also keep on file the names of persons recommended by the different governments as fitted to serve on the international tribunal. Each of the signatory powers should give the names of two persons recognized in their own country as jurists or publicists of merit and having a high reputation for integrity, and the persons thus designated should become members of the tribunal and have their names inscribed in the records of the central bureau. This list of names should be furnished by the central bureau to such of the signatory powers as made known their desire to resort to arbitration. From this list the parties in dispute should select the number of arbiters that they had agreed upon and it was also their right to add other arbiters whose names were not included in the list. These should constitute the court of arbitration, which should assemble at a date fixed by the litigants. These propositions were accepted with but slight changes, among which was the increase of the number of persons to be named by each country from two to four. The design of this, of course, was to facilitate arbitration by the establishment of machinery which should always be in readiness. It was made clear that the powers were in nowise bound to apply to the permanent court.

An indirect result of the conference, but one which was thought to promise important consequences, was the establishment of a permanent council of administration, which should have a general supervision over the central bureau. This council should be made up of the ministers of the signatory powers accredited to

The Hague. It was distinctly stated that the functions of the council were to be purely administrative, but the hope seems to have been entertained by some of the champions of universal peace that it would serve as a sort of standing committee on international affairs and would make for peace in a manner that was not intended by its creators.

HAITI, a republic occupying the western portion of the island of the same name, the eastern part being the republic of San Domingo. The capital is Port-au-Prince.

Area, Population, Education.—The estimated area of the country is 10,204 square miles. The population has been variously estimated, one authority placing it at 572,000, another (1887) at 960,000, while for the year 1894 it was stated to be 1,216,625; this last figure, it is safe to say, is more nearly correct than the others. Very few of the inhabitants are of pure European blood, about 90 per cent. being negroes and nearly all of the remaining 10 per cent. mulattoes. The population of Port-au-Prince is about 50,000; of Cape Haitien, about 29,000, and of Les Cayes, about 25,000.

Public instruction of an elementary nature is free, but is in a very backward condition. Besides private schools and five public lyceums there are about 400 public schools. The official language of Haiti is French, but the vernacular is a dialect known as creole French. The prevailing religion is Roman Catholicism.

Government, etc.—The chief executive authority rests with a president, who by the terms of the constitution is chosen by popular vote; so frequent, however, have been the civil disturbances and insurrections that he is often chosen by the assembly, by the army, or in some other irregular manner. The presidential term is nominally seven years. The president is General Tiresias Simon Sam, who was elected in April, 1896. The legislative power is vested in a national assembly of two houses, the senate and the house of representatives; members of the former, thirty-nine in number, are nominated by the lower house, one-third retiring every three years, while the representatives are chosen by direct vote of the people. The army, which is chiefly infantry, consists nominally of 6828 men; six small vessels of the cruiser type comprise the navy.

Finance.—The chief items of revenue are import and export duties. The total revenue for the fiscal year 1895 was 7,406,321 gourdes, gold; the expenditure for the same year was 8,042,705 gourdes, and for the fiscal year 1897 it was estimated at 8,984,539 gourdes. The total external debt in April, 1897, amounted to 13,476,113 gourdes, gold; of this amount 4,176,113 gourdes were at 5 per cent., and 9,300,000 gourdes at 6 per cent. The internal debt was 4,437,103 gourdes gold, and 10,812,574 gourdes, paper. The value of the gourde silver piece in United States gold is \$0.965. During 1899 the condition of national finance in Haiti was very unsatisfactory, not to say deplorable. There was a serious falling off in revenue due in large part to the depreciation of coffee and to the consequent decrease of trade; this decrease in revenue is seen in the statement that for first quarter of the fiscal year 1897-98 the import customs amounted to 1,104,453 gourdes, while for the same period of the year 1898-99 they amounted to 759,489 gourdes.

Industries, Commerce, etc.—Agriculture is the principal industry; the leading exports are coffee, cacao, and logwood; other exports are cotton, hides, skins, honey, mahogany, and turtle shells. Exports and imports in 1896 amounted to 9,463,903 gourdes and 6,053,835 gourdes respectively; in 1897, exports 12,549,848 gourdes, imports 6,363,798 gourdes; the figures reported for 1898 are, exports £2,655,820 (13,391,939 gourdes), imports £821,625 (4,143,033 gourdes). The quantities of the chief exports for the year ending September 30, 1897, were: Coffee, 73,057,397 pounds; cacao, 2,120,242 pounds; logwood, 112,756,225 pounds. The imports in 1897 from the four countries leading in the foreign trade were: From the United States, 4,379,000 gourdes; from France, 943,000 gourdes; from Germany, 529,000 gourdes; from Great Britain, 309,000 gourdes; total from these countries, 6,160,000 gourdes. The cacao crop for 1898 was 4,032,736 pounds—almost double that of the preceding year. The logwood industry, however, is suffering severely from the competition of other dye stuffs; in 1899 it was reported that in less than five years the export had fallen from 142,015,972 pounds to 64,473,588 pounds. Subsequent to 1897 the import trade in general has shown a serious falling off, and in 1899 the business situation was very grave. Largely responsible for this is the depreciation of coffee, together with an export tariff thereon of about \$3.80 a hundred pounds. It is said that at present this duty cannot be modified, since it constitutes a guarantee for several internal debts. The reported shipping at the ports of the republic in 1897 was, for entrances and clearances, each, 793 vessels, of 1,136,530 tons.

Boundary Question.—The boundary dispute between Haiti and San Domingo promised in 1899 an early settlement. On May 28 of that year President Sam and President Heurieux, meeting at Môle Saint Nicholas, came to an agreement, by which it was thought the delimitation of the frontiers could be satisfactorily determined.

Political Conspiracy.—In the early part of August, 1899, a conspiracy, on the very

point of manifesting itself, was discovered against President Sam in favor of an ex-minister of finance, M. Fouchard. The leaders of the plot were put under arrest and imprisoned.

HAMBOURG, MARK, pianist, born in South Russia, June 1, 1879, the son of Professor Michel Hambourg, who gave him his first musical education. Subsequently he studied under Leschitzky in Vienna, and obtained the Liszt scholarship in 1894. He appeared in Moscow, London, Vienna, visited Australia in 1895-96, gave concerts in Paris and Berlin in 1897, and came to the United States on a concert tour in 1899. His compositions for the piano include a romance and a minuet.

HAMILTON, WALTER, an English author, died February 1, 1899. He was born in London January 12, 1844, and was educated at the Collège de Dieppe. He was a fellow of the Royal Historical Society, vice-president of the Société Française des Collectionneurs d'Ex Libris, and vice-president of the Ex Libris Society. His publications include: *Memoir of George Cruikshank*, 1878; *History of the Poets Laureate of England*, 1879; *The Aesthetic Movement in England*, 1882; *Dated Book-Plates*; *French Book-Plates*; *Collection of Parodies of the Works of British and American Authors*.

HAMILTON COLLEGE, at Clinton, N. Y., was founded in 1812. The chapel, built in 1827, has recently been reconstructed, toward the refurnishing of which an organ costing \$4000 was given by Henry H. Benedict, '69; in 1899 four stained-glass memorial windows were placed in the chapel, in commemoration of Alexander Hamilton, by the class of '88; of Samuel Kirkland, by Joseph Rudd, Esq., '90; of President Simeon North, by Mrs. C. C. Goldthwaite, and of Moses Earl Dunham, '47, by his son. The much-desired hall of philosophy, to complete the new scheme of recitation halls, has been promised by one whose name is withheld, and beginnings have already been made, while the main work will be pushed in the summer of 1900. The college lost a painstaking and true-hearted teacher by the death, July 27, 1899, of Professor Abel Grosvenor Hopkins, who for exactly thirty years had filled the chair of Latin. The gifts to the library during the year were 420 volumes and 2235 pamphlets. The degrees conferred, June 29, 1899, were: A.B., in course, 33; B.Ph., in course, 12; A. B., *nunc pro tunc*, 2; B.Ph., *nunc pro tunc*, 1; A.M., *ex gratia*, 3; A.M., in course, 10; D.D., honorary, 4; LL.D., honorary, 3. For statistics, see UNIVERSITIES AND COLLEGES.

HANDEL AND HAYDN SOCIETY, an oratorio society incorporated in Boston in 1816, holds four annual concerts with the Boston Symphony Orchestra. Conductor, Emil Mollenhauer; secretary, William F. Bradbury, 369 Harvard Street, Cambridge, Mass.

HARBOR IMPROVEMENTS. The most important piece of harbor work undertaken in the United States during 1899 was for the improvement of the ship channels leading into New York harbor. These improvements comprise the construction of what is known as the East Channel, at the entrance to the harbor, and of the Bay Ridge and Red Hook channels. The new East Channel will be made 4000 feet wide and 40 feet deep, and will necessitate the dredging out of 30,000,000 cubic yards of material. The amount of excavation in the Bay Ridge and Red Hook channels aggregates about 16,000,000 cubic yards. The contract for this dredging was awarded to Mr. Andrew Onderdonk, of New York City, for 9 cents per cubic yard. (See DREDGES.) By far the most comprehensive and radical scheme which has ever been suggested for waterways and harbor improvements on the Great Lakes was proposed in December, 1899, by the Government Board of Engineers on Deep Waterways. In substance, the plan proposed is to dam the Niagara River so as to raise the level of Lake Erie three feet above the normal low-water stage during the close of the navigation season. This rise in Lake Erie by backing up the water in the lakes above will, it is estimated, raise the Detroit and St. Clair Rivers and Lake St. Clair about two feet, and Lakes Huron and Michigan about one foot. The cost of the proposed dam in the Niagara River is estimated to be about \$800,000. As designed the dam will consist of a submerged wire or overflow section 2900 feet long, and of thirteen 80 feet wide and 20 to 24 feet deep sluice gates, which can be opened or closed at will. Very careful studies have been made for this plan of lake regulations by the engineers of the Deep Waterways Board, and it is asserted that it is perfectly feasible as an engineering work. Late in December, 1899, a bill was introduced in Congress authorizing the work to be carried out by the Deep Waterways Board, and appropriating \$800,000 for the purpose.

HARDY, ARTHUR SHERBURNE, Ph.D., American author and diplomat, was transferred on April 18, 1899, from the embassy at Teheran to the post of minister to Greece, to succeed Mr. William W. Rockhill, resigned. He was born at Andover, Mass., August 13, 1847. In early life he studied for a time in Switzerland, and later pursued courses at Phillips Academy (Andover) and Amherst College; he then

entered West Point, being graduated in 1869. The next year he left the army, and became professor of civil engineering and mathematics in Iowa College; subsequently he taught the same subjects in Dartmouth. He was associated at one time with the publishers of the *Cosmopolitan Magazine*. From 1897 to 1899 he was United States minister to Persia. He was succeeded at Teheran by Mr. Herbert W. Bowen. Besides several mathematical works, Mr. Hardy has written a number of volumes, chiefly romances, the best known of which is *But Yet a Woman*.

HARLAN, JAMES, former United States senator from Iowa, died at his home in Mount Pleasant, Ia., October 5, 1899. He was born in Clarke County, Ill., August 25, 1820. After his graduation in 1845 from Asbury University, at Greencastle, Ind., he accepted the presidency of a new college in Iowa City. This was not a successful venture, and he turned to the law. In 1850 he was nominated for governor by the Whigs, but was too young to accept the nomination. He was called to the presidency of the Iowa Wesleyan University in 1853, and two years later was elected, as a Whig, to the United States Senate. He was re-elected, and in 1865 resigned to accept the portfolio of the interior in President Lincoln's cabinet; in this position he was retained, but resigned in 1866 to accept a third election to the federal Senate. At the expiration of this term in 1873 he was again a candidate, but was defeated by Mr. William Boyd Allison, who since then has represented Iowa in the Senate.

HARRIMAN EXPEDITION. See ZOOLOGICAL STATIONS.

HARRIS, ADDISON C., United States minister to Austria-Hungary, was appointed to that position by President McKinley on January 10, 1899, to succeed Mr. Charlemagne Tower, promoted to the embassy at St. Petersburg. Mr. Harris was born in Wayne County, Ind., in 1840; was educated at the Northwestern University, studied law, and has practised in Indianapolis. He has served one term in the Indiana Senate. In 1882 he was defeated, as a Republican, for Congress by Mr. William D. Bynum. In the Indiana legislature in 1897 he was a candidate for United States senator.

HARRIS, Rev. GEORGE, D.D., president of Amherst College, was elected to his present position on June 27, 1899, to succeed President Merrill Edwards Gates, resigned. At the time of his election Dr. Harris was president of Andover Theological Seminary. He was born at East Machias, Me., April 1, 1844. After preparing for college at Washington Academy in his native town he entered Amherst, and was graduated in 1866, when he became a student at the Bangor Theological Seminary. Here he remained a year, and then entered Andover Theological Seminary, where he was graduated in 1869. During the next three years he was pastor of the High Street Congregational Church, in Auburn, Me., and in 1872 accepted a call to the Central Congregational Church, Providence, R. I. Here he remained until 1883, when he was made Abbott professor of Christian theology at the Andover Seminary; this position he retained until elected to the presidency of Amherst. From 1896 to 1899 he also acted as president of the Seminary. From 1894 to 1899 he was one of the college preachers for Dartmouth, and in 1898-99 for Harvard. He has contributed many articles on theological subjects to various journals, and from 1884 to 1893 was one of the editors of the *Andover Review*. His *Moral Evolution* (1896) and *Inequality and Progress* (1897), which in part were attempts to answer Kidd's *Social Evolution*, were remarkable for their vigor and originality, and made no small impression among theological and philosophical scholars. Dr. Harris was inaugurated October 11, 1899. The subject of his address was *The Man of Letters in a Democracy*.

HARRIS, Judge HENRY C., Supreme Court judge of the Choctaw nation, died at Harris, Ind. Terr., on November 28, 1899. Judge Harris had long been associated in legal work with the Indians and the white settlers in the West. He was a member of the commission which collected about \$2,000,000 lease money from the United States for the Choctaw nation. He had held many positions of trust, and was one of the strong friends the white people had among the Choctaws.

HARRIS, SAMUEL, D.D., LL.D., professor emeritus of systematic theology in the Yale Divinity School, died at Litchfield, Conn., June 25, 1899. Born at East Machias, Me., June 14, 1814, his collegiate course was taken at Bowdoin, where he was graduated in 1833, after which he studied at the Andover Theological Seminary, being graduated there in 1838. In 1833-34 he taught at the Limerick (Me.) Academy, and at the Washington Academy in 1834-35 and 1838-41. Entering the Congregational ministry, he held pastorates at Conway and Pittsfield, Mass. In 1855 he accepted a call to the chair of systematic theology in the Bangor (Me.) Theological Seminary, which position he held until 1867, when he became president of Bowdoin College. From here he went to Yale in 1871 as professor of systematic theology, and continued in active work until 1896, when he was made professor emeritus. Dr. Harris has a place in the first rank of American theologians. His

published works include: *Zaccheus, a Prize Essay on the Scriptural Plan of Benevolence*, 1844; *The Kingdom of Christ on Earth*, 1874; *Christ's Prayer for the Glorification of His Redeemed; The Philosophical Basis of Theism*, 1884; *The Self-Revelation of God*, 1887; *God, Creator and Lord of All*, 1897. More than on any other of his writings his reputation rests on *The Philosophical Basis of Theism*.

HARRISON, CARTER HENRY, mayor of Chicago, was re-elected to this office, as a Democrat, on April 4, 1899, by a vote of 149,000 against 107,000 for Mr. Zina R. Carter, Republican, and 46,000 for ex-Governor John P. Altgeld, independent Democrat. The campaign attracted wide attention. In 1898 "certain notorious measures, which would have extended for half a century a series of monopoly transit franchises worth \$100,000,000," would have been enacted by the Chicago Board of Aldermen had it not been for the veto power of Mayor Harrison. The attitude of the aldermen was in defiance to public opinion, and bribery was freely charged. It was largely on account of his action on these franchise measures that Mayor Harrison received his support at the polls; his platform concerned itself principally with local issues. The capitalists who had attempted to secure the franchises supported the Republican candidate. This opposition was based chiefly on the alleged laxity under Mayor Harrison in the enforcement of the laws against gambling and other vice, and these assertions seemed, in the main, to be true. Mr. Altgeld represented distinctly the Chicago platform of 1896, and the principle of the municipal ownership of public works. It was estimated that 40,000 Republicans supported Mayor Harrison. The campaign in Chicago disclosed three interesting results: "(1) The growth of independence and of attention to local issues; (2) the dominance of the street-railroad issue, and (3) the growth of sentiment in favor of municipal ownership." See ILLINOIS.

Mayor Harrison is the son of the late Carter H. Harrison, who was mayor of Chicago for five terms, and was assassinated October 30, 1893; he was born in Chicago, April 23, 1860. After studying in the Chicago public schools and the Altenburg (Germany) Gymnasium, he entered St. Ignatius College (Chicago), and was graduated in 1881; after his graduation at the Yale Law School, in 1883, he began the practice of law in Chicago, continuing until 1889, when he engaged in the real estate business. From 1891 to 1893 he was publisher and editor of the *Chicago Times*. On April 6, 1897, he was elected mayor of Chicago, and was re-elected April 4, 1899.

HARVARD UNIVERSITY, at Cambridge, Mass., non-sectarian, co-educational in summer schools only, was founded in 1636, and includes the following departments, the number of students in each of which for the year ending September, 1899, being given: Harvard College, 1902; Lawrence Scientific School, 495; the Graduate School, 326; the Divinity School, 27; the Law School, 613; the Medical School, 558; the Dental School, 131; the Veterinary School, 24; the Bussey Institution, 27; the summer schools, 856; total, including the summer schools, 4947. The faculty of arts and sciences adopted in May, 1899, a new scheme of requirements for admission to Harvard College and the Lawrence Scientific School. The range of election for individual candidates is extended so that the traditional subjects of requirement—Latin, Greek, elementary mathematics, and ancient history—may constitute as little as one-third of their secondary school studies. The proposal was also made to reduce the number of courses required for the degree of A.B. The Asa Gray professorship of systematic botany was assured by the subscription of \$20,000, and \$50,000 of a bequest of Henry Lillie Pierce was received for the library; \$100,000 was given to the Museum of Comparative Zoology, and \$175,000 for an engineering building out of the same fund. The bequest of Edward Austin, amounting to \$433,500, was received in 1899, the income of which is to be devoted to the assistance of needy, meritorious students and teachers. The Henry Clarke Warren bequest was received in the same year, amounting to \$144,000, besides real estate in Cambridge. A gift of \$156,000 was received for the foundation of a professorship of hygiene. Other gifts to the university were \$100,000 for researches for the cure of cancer, \$100,000 for the erection of a building for the department of architecture. The total amount received in bequests and gifts during the year was \$1,544,829. The library was increased by 23,745 volumes, making a total of 528,515 volumes and 427,822 pamphlets. President, Charles William Eliot, LL.D.

HAUER, FRANZ, RITTER VON, a distinguished Austrian geologist, died in Vienna March 20, 1899. He was born in that city January 30, 1822; he studied there and at the school of mines in Schemnitz. He was appointed to the board of mines in Eisenberg, and in 1843 attended the lectures of the geologist, Wilhelm Karl Haidinger, in Vienna. Three years later he became Haidinger's assistant, and in 1849 mining counsel and first geologist in the Imperial Geological Institution. He became director of this institution in 1866. In 1886 he was appointed superintendent

of the court museum of natural history. He was made in 1892 a life member of the upper house of the Austrian parliament. His scientific works treat of the geological and paleontological condition of Austria. Hauer's writings include *Die Cephalopoden des Salzkammerguts aus der Sammlung des Fürsten Metternich*, 1846; *Geologische Übersicht der Bergbaue der österreichischen Monarchie*, 1855, written in collaboration with Franz Fötterle; *Geologische Übersichtskarte von Siebenbürgen*, 1861; *Geologie Siebenbürgens*, 1863, in collaboration with Guido Stache; *Geologische Übersichtskarte der österreichisch-ungarischen Monarchie*, 1867-73; *Die Geologie und ihre Anwendung auf die Kenntnis der Bodenbeschaffenheit der österreichisch-ungarischen Monarchie*, 1875; *Geologische Karte von Oesterreich-Ungarn*. In 1886 Hauer established at Vienna the *Annalen des naturhistorischen Hofmuseums*, which he thereafter edited.

HAUPTMANN. See GERMAN LITERATURE.

HAWAII, or SANDWICH ISLANDS, consists of about a dozen islands in the Pacific Ocean, of which the most important are Hawaii, Maui, Oahu, Kauai, Molokai, Lanai, Nihau, and Kahoolawe. The total area of the islands is 6640 square miles. The population, according to the census begun in September, 1896, was 109,020. The *Statesman's Year Book* estimates an increase up to January 1, 1899, of over 8000, due mostly to immigration, largely Chinese and Japanese. According to the census, the Americans in Hawaii number 3086, a number which is probably considerably larger at the present time. The capital is Honolulu, on the island of Oahu, a flourishing city, with about 30,000 inhabitants. The soil is very fertile, and the chief product is sugar, together with steadily increasing amounts of rice, coffee, hides, wool, etc. Considerable whale oil and bone are exported also.

Commerce and Communications.—The group is connected by steamer lines with the American continent, Australia, and China. The islands of Hawaii, Maui, and Oahu have each a railway system, in aggregate length about 71 miles, and about 250 miles of telegraph, including connection between Hawaii and Oahu. Honolulu has many miles of telephone, as well as a fairly extensive street railway system. One of the prominent subjects of discussion in the United States in 1899 in regard to Hawaii was the project of building a Pacific cable to Hawaii, and eventually to the Philippines, under government ownership or protection. For the year ending June 30, 1899, the trade of Hawaii amounted to \$17,831,463 for exports, and \$9,365,470 for imports. For the calendar year 1899 the exports were \$22,188,206, and the imports \$11,305,581, which shows a substantial gain over the first-mentioned period of twelve months. The exports are sent almost entirely to the United States, and under the existing reciprocity treaty the larger part enter this country free of duty. Of the total amount of exports mentioned for the year ending with June, 1899, nearly \$17,300,000 represent sugar and molasses, the amount of sugar being 462,423,600 pounds, and that of molasses 15,300 gallons, valued at \$542. The imports from the United States average about 76 per cent. of the total imports into Hawaii.

Finance.—The public revenue, 1897, was \$5,042,504.94, and the expenditure \$4,654,926.27, leaving a balance of \$456,804.43, the largest since 1890. In 1896 there was a favorable balance of \$245,967, in 1895 only \$69,226. The bonded debt at the close of 1897 was \$4,119,174.

Education.—Education is general. Recent statistics are not available. In 1897 the sum of \$144,389 was set aside for the purposes of general instruction. There were at that time about 200 schools, with 507 teachers and 14,522 pupils. Of the latter there were 5330 Hawaiian children, 2479 half-castes, 3815 Portuguese, and 1638 Asiatics. Just half of the teachers, or 253, were American, and 69 were British. The remaining 119 were Hawaiian or part Hawaiian. The general intelligence of the inhabitants is high. Of the British, about 95 per cent. are able to read and write; of the French, 92 per cent.; part Hawaiian, 91 per cent.; Germans, 86 per cent.; Hawaiian, 84 per cent.; Americans, 82 per cent.; Norwegians, 80 per cent.; Hawaiian-born foreigners, 68 per cent. Since the natives and part-Hawaiians number about 40,000, the Japanese nearly 25,000, the Chinese over 20,000, and the Hawaiian-born foreigners over 14,000, against but a few thousand Americans, the foregoing figures do not reveal the actually small number of illiterate Americans and other foreigners. Quite a large number of prominent American residents are included with the foreign-born Hawaiians.

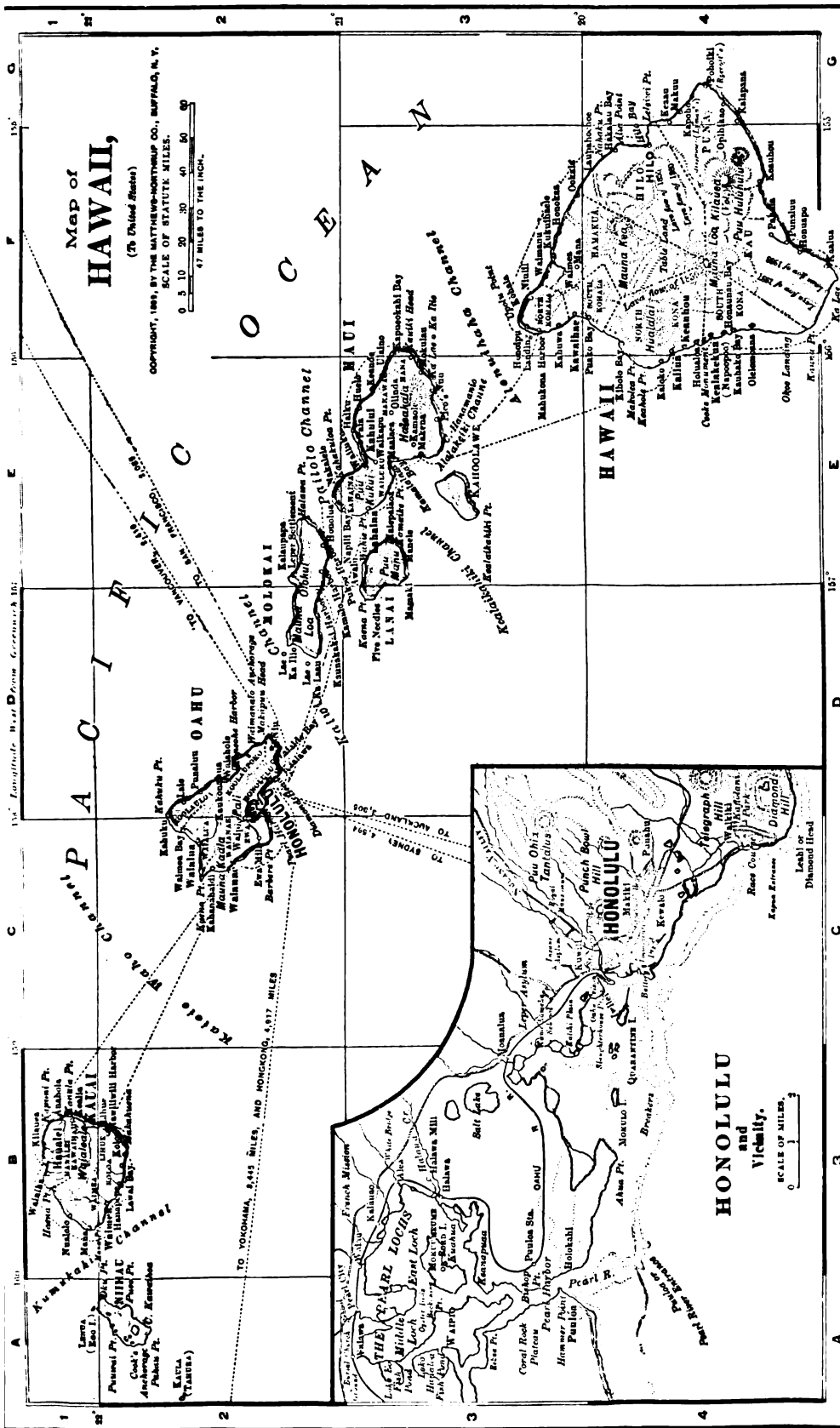
History.—The joint resolution of Congress effecting the annexation of Hawaii declared that "until Congress shall provide for the government of the Hawaiian islands all the civil, judicial, and military powers exercised by the officers of the existing government in said islands shall be vested in such person or persons, and shall be exercised in such manner as the President of the United States shall direct; and the President shall have power to remove said officers and fill the vacancies so occasioned." Nothing was done by the Fifty-fifth Congress toward the organization of the newly acquired islands. Bills were introduced in Congress, but they were opposed on account of their implied intent to make the islands a State of the Union,

and because they placed them on the same footing as States or Territories. Another objection was that the admission of Hawaiian produce to the United States duty free would be a dangerous precedent for the government of our new dependencies. A bill was also introduced to check Chinese immigration to the islands, which took place in spite of the clause in the resolution of annexation, forbidding such immigration. There was a difference of opinion in Hawaii on the question whether the contract labor laws of the United States applied to the islands, and this bill was intended to remove all doubt on that point by asserting definitely that the contract labor laws did so apply. Congress adjourned on March 4, 1899, without taking action in these matters, and the undetermined status of the Hawaiian islands occasioned some anxiety. An important question arose in the matter of the customs relations between Hawaii and the United States. The resolution of annexation contained the following clause on this point: "Until legislation shall be enacted extending the United States customs laws and regulations to the Hawaiian islands, the existing customs regulations of the Hawaiian islands with the United States and other countries shall remain unchanged." The question arose whether such laws as were in force in Hawaii before its annexation to the United States, as were contrary to the constitution and the laws of the United States, were *ipso facto* abolished in consequence of the transfer of sovereignty. When the matter came before the Supreme Court it refused to consider this question, but decided that the constitution and laws of the United States as such had no application to the islands. President Dole, of Hawaii, reported that the general conditions of the country had improved under annexation, and that in certain lines of business, as, for example, in real estate and sugar, there was a considerable rise of values. See VOLCANOES.

HAWKINS, Sir HENRY, the eminent English jurist, was born in Hitchin, England, September 14, 1817, educated at Bedford School, and was called to the bar in the Middle Temple, London, in 1843. He soon acquired a large practice, and after becoming Queen's counsel in 1858, was engaged in nearly every important case that came before the superior courts. He distinguished himself especially in the Tichborne trial for his clever cross-examination. He acted for the crown in the purchase of lands and improvements in London, including property for the Holborn Viaduct, the Thames Embankment, and other new streets. In December, 1898, he resigned from the bench, having served as a judge for more than twenty-two years, and in 1899 he was raised to the peerage as Baron Brampton, of Brampton, in the county of Huntingdon. He is now qualified to sit as a Lord of Appeal.

HAY. The following table, published by the Department of Agriculture, division of statistics, shows the acreage, production, and value of hay in the United States in 1899:

STATES AND TERRITORIES.	Acreage.	Average yield per acre.	Production.	Average farm price per ton December 1.	Farm value December 1.
	<i>Acres.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Dollars.</i>	<i>Dollars.</i>
Maine.....	976,848	.90	879,163	10.10	8,879,546
New Hampshire.....	602,097	.89	535,866	11.76	6,296,466
Vermont.....	843,225	1.14	961,288	9.25	8,901,914
Massachusetts.....	590,707	1.13	667,499	15.50	10,346,234
Rhode Island.....	73,008	.89	64,977	17.35	1,120,853
Connecticut.....	475,482	.94	446,953	14.50	6,480,818
New York.....	4,356,084	1.04	4,530,307	10.45	47,341,708
New Jersey.....	392,191	.83	325,519	15.35	4,996,717
Pennsylvania.....	2,557,475	1.30	3,068,970	11.50	35,296,155
Delaware.....	46,750	1.04	49,620	11.65	566,483
Maryland.....	282,992	1.18	319,781	12.15	3,885,329
Virginia.....	534,608	1.10	588,063	10.25	6,027,646
North Carolina.....	130,526	1.50	195,789	10.10	1,977,469
South Carolina.....	144,354	1.22	176,112	10.30	1,813,264
Georgia.....	109,287	1.45	158,466	13.15	2,083,688
Florida.....	5,942	1.46	8,675	15.35	133,161
Alabama.....	49,547	1.66	82,746	11.40	943,304
Mississippi.....	54,902	1.44	79,059	9.25	731,296
Louisiana.....	25,405	1.95	49,540	9.70	480,536
Texas.....	311,156	1.43	444,953	7.10	3,159,166
Arkansas.....	138,845	1.48	205,491	8.65	1,777,497
Tennessee.....	213,348	1.31	279,786	11.35	3,168,343
West Virginia.....	498,996	1.29	643,707	9.45	6,083,081
Kentucky.....	306,173	1.39	394,933	10.40	4,107,615
Ohio.....	1,641,307	1.30	2,133,699	8.95	19,066,606
Michigan.....	1,352,766	1.22	1,650,375	8.50	14,023,186
Indiana.....	1,562,221	1.34	2,093,376	7.80	16,328,329
Illinois.....	1,883,884	1.29	2,365,710	7.75	18,324,357
Wisconsin.....	1,324,296	1.47	1,946,718	6.85	13,336,618
Minnesota.....	1,514,841	1.70	2,575,220	4.85	11,382,260



STATES AND TERRITORIES.	Acreage.	Average yield per acre.	Production.	Average farm price per ton December 1.	Farm value December 1.
	<i>Acres.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Dollars.</i>	<i>Dollars.</i>
Iowa.....	3,750,727	1.24	5,025,974	5.30	26,637,362
Missouri.....	2,253,682	1.27	3,094,594	6.25	19,339,362
Kansas.....	2,284,018	1.57	3,555,908	3.50	12,445,678
Nebraska.....	2,034,738	1.66	3,377,698	3.70	12,497,488
South Dakota.....	1,943,688	1.43	2,779,474	3.10	8,615,369
North Dakota.....	364,048	1.58	508,796	3.30	2,002,427
Montana.....	361,923	1.42	513,581	7.70	3,957,269
Wyoming.....	271,961	1.47	399,783	6.60	2,638,508
Colorado.....	776,321	2.10	1,630,374	7.35	11,982,514
New Mexico.....	38,510	1.70	65,127	10.60	690,346
Arizona.....	27,624	2.63	72,651	10.35	751,838
Utah.....	124,341	2.50	483,659	7.10	3,449,549
Nevada.....	157,430	1.87	294,488	7.65	2,252,833
Idaho.....	215,958	2.50	539,895	6.30	3,401,833
Washington.....	302,794	2.02	613,864	6.80	4,181,610
Oregon.....	637,190	1.97	1,265,264	6.85	8,608,558
California.....	1,708,087	1.63	2,784,182	8.00	22,273,456
United States.....	41,328,462	1.35	56,655,756	7.27	411,096,187

HAYTL. See HAITI.

HAYWARD, MONROE LELAND, who was elected, as a Republican, to the United States Senate by the Nebraska legislature on March 8, 1899, died at his home in Nebraska City, December 5, 1899. His early life was passed at Willsboro, Essex County, N. Y., where he was born December 22, 1840. After the outbreak of the Civil War he joined the Twenty-second New York Volunteers, and later was transferred to the Fifth Cavalry, with which he served until December, 1862, when on account of disability, caused by illness, he was discharged. He then entered the Fort Edward (New York) Collegiate Institute, at which he was graduated in 1866. Not long after he went to Whitewater, Wis., where he read law and was admitted to the bar. Having removed to Nebraska City, he attained prominence as a lawyer, in 1875 was a member of the State constitutional convention, and in 1886 was appointed judge in the district court to fill out an unexpired term. In 1898 he was the Republican candidate for governor, and though defeated by Mr. William A. Poynter, Fusionist, he reduced the Fusion plurality to less than 3000. In 1899, after a prolonged deadlock in the legislature, he was elected to the Senate by a vote of 74 to 58 for Senator William V. Allen, Populist. The latter was appointed by Governor Poynter on December 13, 1899, to take the seat of Mr. Hayward for the term ending March 3, 1905.

HEART, WOUND OF THE. In the *Revue de Chirurgie* of February 10, 1899, Loison reports in brief ninety cases of wounds of the heart and pericardium in which the diagnosis was verified by operation or at the autopsy. In seventy-eight cases the heart itself was injured. Death resulted in 87 per cent. of the latter cases, in most instances without surgical intervention. In five cases the wounds in the heart were closed by sutures, two of these operations resulting in recovery. In one case which recovered without surgical intervention a healed wound was found some time later, after the man's assassination. Some people have lived for a considerable time with a bullet in the heart. Loison located a bullet, by means of the X-rays, in the heart of a patient. After draining the pericardium he was unable to remove it; but the man made a good recovery. Pagenstecher, of Elberfeld, successfully sewed a stab-wound $3\frac{1}{2}$ centimetres long, near the apex of the heart, in a lad of seventeen. Ophuls reports the case of a patient who lived for a considerable period with a foreign body in his heart, in *Occidental Medical Times*, San Francisco, 1899, XIII., p. 426.

HEMATITE. See IRON.

HENDERSON, DAVID BREMNER, speaker of the House of Representatives in the Fifty-sixth Congress, is a citizen of Dubuque, Ia., and was born at Old Deer, Scotland, March 14, 1840. In 1846 he was brought to Illinois and three years later to Iowa; here he was educated in the public schools and at the Upper Iowa University. He lived on a farm until 1861, when in September he entered the Union service as a private in Company C of the Twelfth Iowa Volunteers. He was commissioned lieutenant of his company and served with it until discharged on account of a wound received in action, resulting in the loss of a leg, February 26, 1863. In the following May he was appointed commissioner of the board of enrolment of the third district of Iowa, serving as such until June, 1864, when he re-entered the army as colonel of the Forty-sixth Iowa Volunteers. Henderson studied law in Dubuque, and was admitted to practice in the fall of 1865; in

November of this year he was appointed collector of internal revenue for the third district of Iowa, and served until 1869, when he resigned to give his whole attention to the law. From this year to 1871 he was assistant United States district-attorney for the northern division of Iowa, and thereafter was engaged in private practice in Dubuque until 1883, when he was elected to the Forty-eighth Congress as a Republican from the third Iowa district. He has been returned to all succeeding Congresses. In the Republican National Convention of 1888 Mr. Henderson was one of the managers of Senator William B. Allison's canvass for the nomination, and in 1896 he presented Mr. Allison's name to the convention at St. Louis. In Congress his principal work has been on the committee on appropriations, the judiciary committee, of which he became chairman in 1894, and the committee on rules. He was chairman of the judiciary committee and ranking member, next to the speaker, on the committee on rules in the Fifty-fifth Congress.

When Speaker Thomas B. Reed retired from politics with the close of the Fifty-fifth Congress, the names of several prominent Republicans appeared in the press of the country as probable candidates for the speakership, but by June Mr. Henderson seemed to be without opposition in his party. When Congress convened on December 4, 1899, Mr. Henderson's name was presented by Mr. Charles H. Grosvenor, of Ohio; the Democratic nominee was Mr. James D. Richardson, of Tennessee, while the Populists named Mr. John C. Bell, of Colorado, and the Silverites Mr. Francis J. Newlands, of Nevada. The vote was: Henderson, 177; Richardson, 153; Bell, 4; Newlands, 2.

HENDRICKS, Dr. GEORGE A., professor of anatomy in the University of Minnesota, died September 24, 1899. Dr. Hendricks was the originator of the graded system in anatomy, and introduced it in his courses at the Minnesota university, to which he came in 1889 from the University of Michigan.

HENRY, GUY VERNOR, brigadier-general, U.S.A., died of pneumonia in New York City, October 27, 1899. He was the son of Major William S. Henry, and was born at Fort Smith, Ind. Ter., March 9, 1839; in May, 1861, he was graduated from the Military Academy at West Point and immediately entered the active service. He was a second and then a first lieutenant in the First Regular Artillery until November, 1863, when he was appointed colonel of the Fortieth Massachusetts Infantry. Among the engagements in which he participated were the Bull Run campaign, during which he was an aide on the staff of General McDowell, the operations at Key West and at Hilton Head, S. C., the battle of Pocotaligo, the bombardment of Fort Sumter, and the battle of Cold Harbor. For his services in the war Henry received several brevets and Congress voted him a medal of honor for "noteworthy and conspicuous gallantry while colonel of the Fortieth Massachusetts Volunteers when leading the assaults of his brigade upon the enemy's works at Cold Harbor, Va., June 1, 1864, where he had two horses shot under him, one while in the act of leaping over the breastworks of the enemy."

In military circles, however, Henry's reputation rests more upon his subsequent service against the Indians; from 1870 to 1892 he was on the frontiers and saw much hard fighting. He commanded under General Crook a squadron in the Big Horn and Yellowstone expeditions, and in the battle of Rosebud Creek, Mon., he was shot through the face and lost the sight of one eye. For his bravery in this action he was breveted a brigadier-general. He served with distinction in the Wounded Knee campaign of 1890-91, at which time he was a major in the Ninth Cavalry; the next year he was made lieutenant-colonel of the regiment and in 1893 was transferred to the Third Cavalry. In 1897 he became colonel of the Tenth Cavalry. Soon after the outbreak of the Spanish-American war he was made a brigadier-general of volunteers, and on October 11, 1898, was promoted to the rank of brigadier-general in the regular establishment. In the war he commanded a brigade under Major-General Nelson A. Miles in Puerto Rico, of which island from December, 1898, to May, 1899, he was military governor, succeeding Major-General John R. Brooke. In the same month (December) he was made a major-general of volunteers. About a week before he died General Henry was appointed to the command of the Department of the Missouri. He was regarded as an officer of great efficiency. Among his publications is *Military Records of Civilian Appointees in the United States Army*.

HEREDITY. See BIOLOGY; ZOOLOGICAL SOCIETIES (paragraph British Association for the Advancement of Science).

HERRERA, General TOMASO, a Colombian politician, died in New York, June 27, 1899, at the age of sixty-two years. He was born in Panama, and was educated in that city and in Cartagena. He entered politics and became a leader of the Conservative party. At one time during a revolutionary period Herrera was arrested and condemned to be shot; the sentence, however, was commuted to banishment, and he passed ten years as an exile in Guatemala. Having returned to

Colombia, he served as prefect of Panama and as secretary of the interior under Ricardo Arango. He was ex-president of the Colegio del Istimo at Panama and was president of or a director in various commercial, agricultural, and political associations. He founded the Bolivar Asylum at Panama.

HERSCHELL, First Baron, **FARRER HERSCHELL**, G.C.B., D.C.L., LL.D., chairman of the Anglo-American Joint High Commission (see CANADA), created in May, 1898, by the British and American governments, died in Washington, D. C., March 1, 1899. He was born of mixed Jewish and Christian parentage November 2, 1837. He was graduated at the University of London in 1857, receiving his B.A. degree with classical honors. He was admitted to the bar at Lincoln's Inn in 1860, and became a bencher of the Inn and Queen's counsel in 1872; in the latter year he was also appointed examiner in common law at the University of London. He sat in Parliament, as a Liberal, for the city of Durham from 1874 to 1885, when he unsuccessfully stood for the Commons in the North Lonsdale division of North Lancashire. He was made recorder of Carlisle in 1873, serving until 1880, when he was called to the solicitor-generalship in Gladstone's ministry and was knighted. His term as solicitor-general ended in 1885; the following year he was raised to the peerage and served as Lord High Chancellor from February to June. He was president of the Royal Commission, the investigations by which resulted in the act of 1888, which caused the Metropolitan Board of Works to be superseded by the London County Council. In 1890 Lord Herschell was appointed Warden of the Cinque Ports, and in Gladstone's last ministry, 1892-95, served again as Lord High Chancellor. He was appointed in 1897 a member of the tribunal of arbitration for the settlement of the boundary dispute between British Guiana and Venezuela. His son Richard, born in 1878, succeeded to the title.

HERVÉ, **AIMÉ MARIE ÉDOUARD**, French journalist, died in Paris, January 4, 1899. He was the son of a professor of mathematics at St. Denis, Réunion Island, where he was born May 28, 1835. He was educated at the Collège Napoléon, Paris, receiving there the philosophical prize in 1854, whereupon he entered the École Normale, but left soon after to devote his entire attention to journalism. After a period of service upon the *Revue de L'Instruction Publique* and the *Revue Contemporaine*, he was successively editor of the *Courrier du Dimanche* in 1863, of the *Temps* in 1864, and of the *Epoque* in 1865. The hostility of the government soon rendered it almost impossible for him to maintain connection with a French newspaper; he therefore transferred his services to the *Journal de Genève*, of which he became one of the chief correspondents. On January 19, 1867, an imperial letter was issued, instituting a new system for the press; taking advantage of this, Hervé, together with Jean Jacques Weiss, founded the *Journal de Paris*. This paper soon achieved note by its persistent attacks upon the government. In the general elections of May, 1869, Hervé was the candidate of the Liberal opposition under the patronage of Louis Adolphe Thiers, but was defeated by the government candidate. Upon the retirement of Weiss he became sole editor of the *Journal de Paris*, and as a branch of this paper, being conducted by the same literary staff, he established the *Soleil* in 1873. It was about this time that Hervé and Edmond About, editor of the *Dis-Neuvième Siècle*, became involved in a controversy which led to a duel, in which About was slightly wounded. In 1876 the *Journal de Paris* was discontinued, and Hervé's editorial work was given wholly to the *Soleil*, at head of which paper he remained to the time of his death. He published in 1869 a series of articles on English elections, entitled *Une Page d'Histoire Contemporaine*. He received the cross of the Legion of Honor in 1873, and in February, 1886, was elected to the French Academy to succeed the Duc de Noailles. In the *Soleil* Hervé frequently wrote over the pen name Raoul Valnay. His journalistic style was notable for its qualities of conciseness and dignity.

HERZEGOVINA. See BOSNIA AND HERZEGOVINA.

HETH, General **HENRY**, a Confederate leader, died at his home in Washington, D. C., September 22, 1899. He was born in Virginia in 1825 and was graduated from the Military Academy at West Point in 1847. In 1855 he had risen to the rank of captain, and in 1861 he resigned and entered the Confederate service as a brigadier-general. He became a major-general in May, 1865, commanded a division of General A. P. Hill's corps in Virginia, and served with distinction at Gettysburg, at Chancellorsville, and throughout the campaigns of 1864 and 1865. Through his experience in the United States Army Heth had acquired a wide knowledge of Indian affairs. In those early days he had been a friend of Ulysses S. Grant; when the latter became President, he offered Heth, who was then in straitened circumstances, the opportunity of taking charge of the Indian bureau. Heth declined, but subsequently accepted from the President the position of personal adviser in relation to certain frauds that were being investigated. In recent years General Heth lived

in Washington, where he was engaged in writing the history of the various campaigns through which he had passed.

HEUREAUX, General ULISES, president of the republic of San Domingo, was shot and killed by Ramon Caceres near Moca, in the northern part of the island, on July 26, 1899. (See SAN DOMINGO, paragraph Assassination of Heureaux.) Heureaux was born of negro parentage in Puerto Plata, San Domingo, in 1846. He was a man of unusual intellectual and will power. He was self-educated, was an accomplished linguist, and had a long military career, in which he proved himself both brave and capable. At the age of sixteen he entered the army as a private, and in three years rose to the rank of colonel. From 1863 to 1874 he was prominent as a leader in the insurrections against Bonaventura Balz and twice was exiled. In 1876 a rebellion led by him against General Gonzalez brought his party into power. In 1882 he was elected president, and he retained the office until the time of his death. The presidential term of office in San Domingo is four years, and the constitution forbids the election of a president for the ensuing term, but Heureaux's power was so great that for eighteen years he ruled as a despot with only the forms of republican government. He was accused of immorality in both his private and his public life, and his financial policy has involved San Domingo in grave difficulties. In his defence it can be said, however, that during his régime peace and order prevailed in the republic to a greater degree than they had for many years.

HILBORN, SAMUEL GREELEY, ex-member of Congress from California, was born at Minot, Me., in 1834; died in Washington, D. C., April 19, 1899. After his graduation at Tufts College he studied law, and being admitted to the bar in 1861, began practice at Vallejo, Cal. He served in the State Senate in 1875-79, and in the latter year was a member of the constitutional convention. Being appointed United States district attorney in 1883, he removed to San Francisco, removing upon the expiration of his term to Oakland, where he resumed private practice. He was elected to the Fifty-third Congress, but was not allowed to take his seat; he was a member, however, of the Fifty-fourth and Fifty-fifth Congresses.

HILLIS, NEWELL DWIGHT, M.A., D.D., pastor of Plymouth Church (Congregational), Brooklyn, accepted the call to this charge January 22, 1899, to succeed the Rev. Dr. Lyman Abbott, whose resignation of the preceding November was to take effect March 1. Dr. Hillis came from the Central Church (Independent), Chicago. He was born at Magnolia, Ia., September 2, 1858, and was educated at Iowa College, Lake Forest University, and McCormick Theological Seminary. Having entered the Presbyterian ministry, he had the following charges: Peoria, Ill., 1887-90; Evanston, Ill., 1890-94; Central Church, Chicago, 1894-99, succeeding in the last position Professor David Swing. Dr. Hillis is a brilliant preacher and a man of literary tastes. He has written: *The Investment of Influence*; *How the Inner Light Failed*; *A Man's Value to Society*; *Foretokens of Immortality*.

HILTON, HENRY, sometime judge of the Court of Common Pleas in New York City, died at Saratoga, N. Y., August 24, 1899. Judge Hilton is remembered chiefly as the counsel of A. T. Stewart, the "merchant prince." He was born at Newburg, N. Y., October 4, 1824, and in childhood went with his father to live in New York City. At about fifteen years of age he entered the employ of the law firm of Campbell and Cleveland; subsequently he was admitted to the bar and became managing clerk of the firm. It was in this capacity that he came to have a thorough knowledge of Stewart's affairs, and in 1850 the latter made him his private counsel and secretary. From 1857 to 1863 Hilton was judge of the Court of Common Pleas in New York and then he became a park commissioner; but he continued his connection with the Stewart business and his care for the investment of the merchant's immense income. When Stewart died in 1876 Hilton became executor, a bequest of a million dollars having been made to pay for his services. In payment of this legacy Mrs. Stewart transferred to him the great business that had been built up by her husband. The Stewart store was then the largest in New York. In 1886 Mrs. Stewart died, and by her will Hilton was intrusted with the distribution of a large part of the estate. Litigations arose, but were finally adjusted by compromise. Hilton's career was eminently successful until he attempted to carry on for himself the mercantile business of his former client. The firm name of A. T. Stewart was changed to Hilton, Hughes, and Denning; dissensions arose, annual losses ensued, the firm was repeatedly reorganized, and finally in August, 1896, failure came. The debts of Mr. Hughes, who was a son-in-law to Hilton, were paid by the latter, though he was not compelled to do so. The old store at Broadway and Tenth Street is now occupied by John Wanamaker.

HINCKS, Rev. THOMAS, F.R.S., English Unitarian clergyman, died January 25, 1899. He was born at Exeter, July 15, 1818, and was educated in Belfast and at Manchester College, York, which is now at Oxford. On account of vocal difficulty he retired from the ministry and devoted himself to literary and scientific work.

having special reference to biology. He published *History of British Hydroid Zoophytes* (1868) and *History of the British Marine Polyzoa* (1889).

HIRSCH, BARONESS CLARADE DE, widow of the late Baron Maurice de Hirsch de Gereuth, the Austrian Jewish financier and philanthropist, died in Paris, April 1, 1899. At the time of the Baron's death, which occurred near Pressburg, Hungary, on the 20th of April, 1896, it was reported that he had acquired a fortune estimated at \$200,000,000, and had an income of between \$15,000,000 and \$20,000,000 a year. It was also said that the estimated benefactions of himself and wife amounted to about \$100,000,000. These benefactions were chiefly for the promotion of the education and welfare of Jews in various parts of the world. Baroness de Hirsch continued the work after her husband's death, giving enormous sums in Europe and America; and the bulk of her vast estate, estimated in 1899 at \$125,000,000, she bequeathed to charities. See **BARON DE HIRSCH FUND**.

HISTORICAL ASSOCIATION, AMERICAN, organized in 1884, and incorporated by Congress in 1889, had in 1899 a membership of 1550. Its object is the "promotion of historical studies, the collection and preservation of historical manuscripts, and kindred purposes in the interest of American history and of history in America." It has published five volumes of *Papers*, ten annual *Reports*, and eight volumes of *Church History Papers*. General meeting for 1900 at Detroit, Mich., December 27-29. President, Edward Eggleston; secretary, Herbert B. Adams, Johns Hopkins University, Baltimore, Md.

HOANG NAN. See **LEPROSY**.

HOBART, GARRET AUGUSTUS, Vice-President of the United States, was born in Monmouth County, N. J., June 3, 1844, and died November 21, 1899. Mr. Hobart was one of the ablest and most popular men who have taken up the difficult and somewhat anomalous duties of the Vice-Presidency. With the active functions of his office practically limited to the work of presiding over the Senate, and with no official, public relations with the President, and no portfolio in the cabinet, Mr. Hobart was nevertheless in close touch with the policy and operations of the government. He was the intimate friend and councillor of President McKinley, and undoubtedly exercised a strong influence on the conduct of public affairs. In the Senate he was popular with members of both parties, whom he served equally by his fair ruling. He is said to have had a high regard for the dignity of his office, which he believed to have been intended as one of real influence and power. Mr. Hobart had, indeed, reached the most successful period in a life of widespread interest. He was prominent as a successful business man, honorably known in New York financial circles, the possessor of a large fortune, and a type of politician of the best kind. He was one of the foremost political figures of his own State, New Jersey, and extensively acquainted with Republican leaders throughout the country. Though born poor, he entered college, and graduated from Rutgers in 1863, at the age of nineteen. He became a counsellor-at-law in 1869, having studied during the previous six years in the office of his father's friend, Socrates Tuttle. Two years later he made his appearance in politics as city counsel of Paterson, and in support of Mr. Tuttle, candidate for mayor. His subsequent political career made him a power in the State Republican councils, and to him is generally given the credit for removing New Jersey, in 1895, from the list of Democratic States. He served in both the house and senate of his State, in each becoming presiding officer. In 1884 he received the complimentary nomination for United States senator, in which year the Democratic majority elected John R. McPherson to that office. Mr. Hobart appeared averse to accepting political positions that would take him out of his State, and several times refused nominations for Congress. He was twice offered the candidacy for governor; one of these offers was in 1895, when, instead of accepting, he devoted his entire time to procuring the nomination of his friend, John W. Griggs, the present United States attorney-general. Mr. Hobart was a delegate to all the national Republican conventions from that of 1876 up to the one which nominated him for the Vice-Presidency. He was chairman of the New Jersey State Republican Committee (1880-90), and in 1884 became a member of the National Committee. Upon his nomination in 1896, on the ticket with William McKinley, he came out uncompromisingly for the gold standard, this stand being generally regarded as having an important influence on the campaign. In business, Mr. Hobart was regarded as of unquestionable integrity. His wide activities included the presidency and general managership or directorship of a large number of corporations, some sixty in all. To many of these he had acted as general counsel. In 1895 he was appointed one of the arbitrators of the Grand Trunk lines and General Traffic Association of the United States, at an annual salary of \$15,000. This position he resigned upon his election as Vice-President. Mr. Hobart married Jennie Tuttle, daughter of Senator Tuttle, in 1869. Mrs. Hobart survives him, as does his son, Garret A. His home was in Paterson, N. J.

HOCKEY, ICE. See ICE-HOCKEY.

HOFFMAN, Dr. WALTER J., United States consul at Mannheim, Germany, died November 8, 1899, at the age of 53 years. He was a native of Reading, Penn., and a graduate of Jefferson Medical College. He was formerly connected with the Smithsonian Institution, and before that with Western scientific expeditions. He had received decorations from a number of foreign rulers and scientific bodies.

HOFMEYR, JAN H., a South African journalist, and leader of the Afrikaner Bond, was prominent in 1899 for his part in the negotiations that followed the conference of President Kruger and Sir Alfred Milner, at Bloemfontein, on May 30. He visited Pretoria, and partly through his influence the president offered better conditions of franchise, but could not be persuaded by Mr. Hofmeyr to grant the "five years' franchise." Mr. Hofmeyr was one of the Cape representatives at the Ottawa conference; he spoke at the Colonial conference in 1887, and has represented the Cape at other conferences. Formerly he was an ally of Mr. Cecil Rhodes, but his friendly political relations with the latter were broken off after the Jameson Raid in 1895, and in the Bond caucus of 1898 was in active opposition to him. Mr. Hofmeyr has long been active in Cape politics, and has served as a mediator between the Cape government and the Boers. He has edited the Cape Town *Volksstem*.

HOG-CHOLERA. See SERUM THERAPY.

HOGG, Rev. MOSES DRURY, D.D., pastor of the Second Presbyterian Church of Richmond, Va., died in that city, January 6, 1899. He was born in Hampden-Sidney, Va., September 17, 1819. He was a man of remarkable persuasiveness and eloquence, and was recognized as one of the greatest preachers of the South. He had been pastor of his church in Richmond for fifty-two years. During a part of the Civil War he was a chaplain in the Confederate army, in which position he devoted himself to the welfare of the men; at one time he ran the blockade to England in order to obtain Bibles and other religious literature for the soldiers, and was successful through the assistance of the Earl of Shaftesbury, from whom he received Bibles and Testaments valued at £4000. In 1874 he was moderator of the General Assembly of the Presbyterian Church, South, which met in Savannah, and in the face of much opposition he successfully advocated the establishment of "fraternal relations" with the Presbyterian Church, North. Not only as a pastor, but as a citizen of wide influence, was Dr. Hogg regarded with esteem throughout Virginia.

HOGG, JABEZ, a prominent English ophthalmic surgeon, died April 23, 1899. He was born at Chatham, April 4, 1817; was educated at the Rochester Grammar School, the Hunterian School of Medicine, and the Charing Cross Hospital. He held several positions of honor in various medical societies, and practised as an ophthalmic surgeon from 1850 to 1895. In 1843 he accepted a position on the London *Illustrated News*, and from 1845 to 1895 he edited the *Almanack* of that paper. Among his publications are: *A Manual of Photography*, 1845; *A Manual of Domestic Medicine*, 1848; *English Forests and Forest Trees*, 1853; *Experimental and Natural Philosophy*, 1854; *The Microscope*, 1854; *The Ophthalmoscope*, 1858; *A Manual of Ophthalmoscopic Surgery*, 1863; *The Treatment and Cure of Cataract*, 1871-72.

HOLBURN, JOHN GOUNDRY, member of the British Parliament, died January 23, 1899. He was born April 12, 1843, and was self-educated. From 1871 to 1875 he was president of the Edinburgh and Leith Trades Council, and was a member of the Leith Town Council from 1890 to 1895. Holbourn was engaged in the tinplate business. He represented in Parliament Northwest Lanarkshire, in the interests of the Liberal and Labor party.

HOLLAND. See NETHERLANDS.

HOLLS, GEORGE FREDERICK WILLIAM, D.C.L., a prominent lawyer of the New York bar, was appointed by President McKinley secretary of the American delegation to the peace conference which met at The Hague in May, 1899. The appointment of the delegation was announced by Secretary of State Hay on April 6, 1899. Mr. Holls was born at Zelienople, Penn., July 1, 1857; was graduated at Columbia College in 1878, and at the Columbia Law School in 1880. In 1883 he was defeated, as a Republican, for State senator. Since 1889 his home has been in Yonkers, N. Y. He has been actively associated in the work of the Legal Aid Society of New York, and the Charity Organization Society. In 1894 he was a delegate-at-large to the New York State constitutional convention, and rendered most valuable services in the deliberations of that body. In 1898 he received the degree of Doctor of Civil and Canon Law from the University of Leipzig. Besides numerous papers, essays, and lectures on political subjects, he has written *Frans Lieber*, a sketch, and *Sancta Sophia and Troitsa*.

HONDURAS, a Central American republic, bordering on the Caribbean Sea and touching Pacific waters at the Gulf of Couchagua, between Salvador and Nicaragua. The capital is Tegucigalpa.

Area and Population.—The republic comprises 15 departments, the total area of which is about 43,000 square miles, and the population (1895) about 400,000. Only a small part of the inhabitants are of Spanish descent, the great majority being Indians. The population of the chief towns are: Tegucigalpa, 13,000; Comayagua, 13,000; Truxillo, 4000; Yoro, 4000.

Government and Education.—The present constitutional law of the country is a charter proclaimed in October, 1894, by which the executive authority is vested in a president, who is elected by popular vote for a term of four years, and is assisted by a ministry, the members of which direct the departments of the interior, finance, war, public instruction and justice, and public works. The president is Señor Terrencio Sierra, who was inaugurated February 1, 1899. The legislative power devolves upon a congress of deputies, who represent the people in the proportion of one to 10,000. The national militia consists of 20,000 men, but the regular army is said to number only 500. There is no state church and the principle of religious liberty is recognized, though Roman Catholicism is the dominant faith. Education is gratuitous, secular, and nominally compulsory. Besides 11 so-called colleges, there are about 690 schools, with about 23,800 pupils. English is taught in the schools.

Finance.—The chief items of revenue are customs duties and imports on alcoholic liquors and tobacco. For the fiscal year 1896 the revenue was 1,901,606 pesos, and the expenditure 2,264,586 pesos. For the fiscal year 1898 the revenue and expenditure were reported to be £217,288 (2,424,900 pesos) and £215,129 (2,400,800 pesos) respectively. The internal debt in 1896 was about 6,000,000 pesos. The external debt in July, 1898, with interest arrears, amounted to \$84,529,860. The interest on this has not been paid since 1872. On October 1, 1899, the value of the peso in United States currency was \$0.436.

Industries and Commerce.—The chief industry is agriculture, and the most important product bananas. Other products are tobacco, coffee, sugar, indigo, and cacao, while wheat and maize are grown for domestic consumption. For purposes of agriculture or mining, individuals or companies may acquire state lands from the government. Cattle breeding has come to be an important industry. The forests and uncultivated lands abound with various valuable products, including aloes, copaiba, tamarinds, vanilla, dye woods, medicinal plants, vegetable ivory, cabinet woods, and rubber. The mineral resources of the country are unusually great, but mining as yet is not well developed. About seventeen companies of some importance are said to be in operation, but statistics of their production are not available. Among the metals and other minerals in Honduras are gold, silver, platinum, iron, lead, tin, zinc, copper, nickel, bismuth, coal, salt, sulphur, and opals. The value of the gold washings is estimated at from \$150,000 to \$250,000 annually. In 1898 about seven-tenths of the imports came from the United States, and about four-fifths of the exports went to that country. The value of the imports for that year, in United States gold, was \$1,166,441, and the exports \$1,235,952. The export of bananas amounted to \$424,591; bar silver, \$374,153; cattle, \$116,954. One of the principal imports is cotton goods. During 1898 the Spanish-American war interfered seriously with the trade of Honduras. From January to November, 1899, upward of 200,000 bunches of bananas were exported from Omoa.

Communications.—There are 60 miles of railway, connecting Puerto Cortez on the Gulf of Honduras with La Pimienta by way of San Pedro Sula. Two other lines have been projected, one from La Pimienta to the Pacific coast and one from Puerto Cortez along the Caribbean coast to Truxillo. In 1897 there were 155 telegraph offices, with lines aggregating 2732 miles. Post-offices in 1896 numbered 237.

HONG KONG, an island near the mouth of the Canton River, China, is a British crown colony, administered by a governor, with an executive and a legislative council. It is the chief centre of British trade with China, and is a British naval and military station, strongly fortified and of the first rank, forming also the headquarters of the China squadron. A portion of the mainland, embracing an area of about 376 square miles, was in 1898 leased to Great Britain by China for 99 years, and this territory is administered as a part of the colony of Hong Kong. Included in this lease are the waters of Mirs Bay and Deep Bay, and the island of Lan Tao. The formal taking over of the outlying districts occasioned a riot, in the course of which the natives fired on the police. The area of Hong Kong proper is 32 square miles, and the population is 236,382, exclusive of the military and naval population. Including the latter, there are about 14,000 whites in Hong Kong. The capital is Victoria, commonly known as Hong Kong, which extends for several miles along the bay. The harbor is one of the finest in the world. There is no customs house at Victoria, the port being free, and estimates regarding the value of the trade are chiefly made from mercantile returns. Great Britain has developed a large trade with China

through this possession, however, amounting annually in imports and exports to the value of nearly \$15,000,000, and as much more is divided among India, Australia, the United States, and Germany. Hong Kong is a trade centre of many kinds of goods. There are some important local productions and industries.

HOPKINS, ABEL GROSVENOR, D.D., professor of Latin in Hamilton College and dean of the faculty, died at his home in Clinton, N. Y., July 27, 1899. He was born at Avon Springs, Mass., December 5, 1844. After his graduation at Hamilton in 1866 he studied theology at Auburn Seminary, in which his father was a teacher. Subsequently he accepted the chair of Latin at Hamilton, which he held until the time of his death.

HORNBY, Sir WINDHAM, K.C.B., British admiral, retired, was born July 23, 1812; died June 28, 1899. He was educated at the Royal Naval College, Portsmouth. He was made a lieutenant in 1833; his subsequent promotions were as follows: Commander, 1841; captain, 1846; rear-admiral, 1865; admiral, 1877. From the last-named year till 1892 he served as a prison commissioner, and for his services as such he was made a K.C.B. in 1892. Admiral Hornby was recognized as one of the best English authorities on naval evolutions and tactics.

HOSPITAL ABUSE. The pauperization of a community through indiscriminate reception of free patients into hospitals is analogous to, though far less frequent than, the same process with regard to dispensaries. This fact has been recognized in Paris, and the year 1899 has seen the first propositions formulated by French physicians for the correction of the condition. The following is a compendium of the suggestions: The hospital shall offer free treatment to the poor and needy only; payment shall not be required of domestic servants, workmen, and employees whose wages do not exceed a given small sum; no one whose rent exceeds \$200 a year or who pays rates shall be received at all, except in cases of those who are unable to pay usual fees for a serious operation; before admission every case shall be investigated by persons designated by the hospital authorities, or shall be endorsed by medical men connected with the hospital; but in an emergency a person may be received into the hospital without inquiry. It is stated that similar regulations have been in force for years in Providence, R. I.

HOTCHKISS, Major JED, topographer and mining geologist, died at his home in Staunton, Va., January 17, 1899, in his seventy-second year. He was born at Windsor, N. Y. During the Civil War he was topographer for General Robert E. Lee and General "Stonewall" Jackson, and prepared many of their campaign maps. Almost all the maps of Virginia made from the time of the war to the beginning of the work of the United States Geological Survey in that State are due to the efforts of Major Hotchkiss. When in 1882 William B. Rogers, State geologist of Virginia, died, leaving much of his work in manuscript, Major Hotchkiss was chosen to prepare the papers for publication. He was a member of the National Geographic Society from the time of its organization in 1888, and contributed largely to its success.

HOWARD, Lieutenant-Colonel GUY, the eldest son of General O. O. Howard, was killed in action October 21, 1899, in the Philippines. Colonel Howard was chief quartermaster at the front with General Lawton, who himself was killed on December 19. At the time of his death Colonel Howard was in charge of the work of establishing a base at San Isidro, and was killed near that vicinity while supervising the transportation of supplies. Colonel Howard had grown up to an army life. He was with his father in the Indian campaign of the Northwest, and was given a lieutenant's commission in recognition of his services at the time of the Custer massacre in 1876. In 1883 he became a captain, and was transferred to the quartermaster's department. In May, 1898, he was appointed quartermaster and a major of volunteers, and in August, 1898, he was advanced to the office of chief quartermaster, with the rank of lieutenant-colonel. He was on General Young's staff when killed.

HOWELL, Commander CHARLES P., U.S.N., chief engineer on the battleship *Maine* at the time of its destruction in Havana Harbor, died December 8, 1899. He was fifty-one years of age. He was a graduate of the United States Naval Academy at Annapolis, and had served twenty-seven and a half years, which included about eighteen years of sea duty. At the time of his death he was stationed at the Brooklyn Navy Yard as chief engineer.

HOWELL, GEORGE R., archivist of New York State, died in Albany, April 5, 1899. He was born at Southampton, New York, in 1833; was graduated at Yale in 1854, and at Princeton Theological Seminary ten years later. For many years he was assistant State librarian, and for a time acting State librarian. In 1889 he was appointed State archivist. Mr. Howell was a man of considerable literary ability. He wrote a number of works on historical subjects, and was an authority on local history and genealogy.

HUGUENOT SOCIETY OF AMERICA, an association of persons descended from Huguenots, founded in 1883. President, Frederic J. De Peyster; Secretary, Mrs. James M. Lawton, 105 East Twenty-second Street, New York City.

HUMANE EDUCATION SOCIETY, AMERICAN, founded in 1889 for the dissemination of books, pamphlets, etc., encouraging the humane treatment of animals, had in 1899 a membership of 300. Its work is carried on in connection with the Massachusetts Society for the Prevention of Cruelty to Animals (*q. v.*). President, George T. Angell; secretary, Joseph L. Stevens, 19 Milk Street, Boston.

HUNGARIAN LITERATURE. *History.*—A survey of the literary output for the past year in Hungary shows, on the whole, fewer works than usual which may be ranked as of permanent interest. History, however, and especially their own national history, is always the strong point among Magyar writers, and in this respect 1899 has not proved an exception. First in point of interest is the tenth and concluding volume of the monumental *History of the Magyar Nation*, which the late Sándor Szilágyi left unfinished at his death, and which his successors, Sándor Márki and Gusztáv Beksic, have brought down to date, the present volume covering the last fifty years, or "Modern Hungary." This really colossal work is now being rivalled by one of equal magnitude in the field of universal history—a *Great Illustrated History of the World*, edited by Henrik Marczali, the leading historian of Hungary, who will have the help of numerous specialists. The work will be complete in twelve sumptuous volumes, two of which have already been issued. Another comprehensive publication, which has this year reached its fourth volume, is Professor Gyula Schvarcz's *History of Democracy*, a work of recognized merit, which has already won the author fame. Professor Schvarcz is an original thinker, and in his new volume, which deals with the Roman republic down to the year 275 B.C., he places himself in direct opposition to Mommsen and most other modern historians of Rome. A volume which possesses an interest no less biographical than historical is the sixth in the series of Louis Kossuth's complete works, now being issued posthumously, under the editorship of his son Francis. The new volume contains his *Historical Studies*, and there is an appendix reproducing part of his political correspondence with King Victor Emmanuel, Prince Jérôme Napoleon, and others.

Fiction.—In this department there is little that is really noteworthy. The veteran novelist Jókai, although as active as ever in other branches of literature, has added nothing to his already formidable list of romances. The two volumes which easily head the list for the year are the new novels of Ferencz Herczeg and Sándor Bródy. The former's *Story of a Girl* is praised as a vigorous and truthful picture of social life in a small Hungarian town, while the characters are drawn with considerable felicity and a mild touch of satire. *The Silver Goat* is regarded as Bródy's most mature work, and has been pronounced by some critics the best novel that Hungary has produced in the last five or six years. In tracing the career of a poor law student, who ultimately becomes a member of Parliament and a highly influential politician, the author has set before us a series of striking pictures of the various social strata which go to make up contemporary life in Budapest, in which he has proved himself a realist of the best sort. Other works of fiction worthy of mention are István Szomaházy's *Uneven Wednesdays*, and a volume of short stories, *Autumn Hunting*, by Árpád Berczik, who is better known as a writer of comedies.

Poetry.—Three volumes only need separate mention—Dezső Ambrozovics's *Verses* are mildly melancholy and are saved from monotony only by a remarkable versatility. *Songs and Stories*, by Antal Radó, offers a decided contrast, being full of gentleness, and a homely, cordial warmth, with an occasional tinge of mild sarcasm. The third volume contains the *Recent Poems* of Emil Makai, showing the deep feeling and finished versification which his readers have learned to expect from him.

HUNGARY, the eastern part of the dual monarchy of Austria-Hungary, has an area of 125,039 square miles, with a population in 1896 of 18,550,512, and embraces, besides Hungary proper, the kingdoms of Croatia-Slavonia and Transylvania. The capital is Budapest, with a population in 1890 of 500,384. The next largest towns are Szeged, population, 87,410, and Szabadka, population, 73,526. Agriculture, though carried on in a primitive manner, is the chief industry, supporting over half of the population. The principal crops are wheat, maize, barley, rye, and oats, the total production of which exceeds the home consumption. Forests are abundant, covering nearly 30 per cent. of the kingdom. In minerals Hungary is one of the richest of countries, the principal ores being gold, silver, lead, copper, iron, coal and lignite, manganese ore, etc. Internal communication is chiefly by means of the navigable rivers and canals, which have a total length of over 3000 miles. The railway mileage at the beginning of 1898 was 9784, of which 4680 belonged to the state. The entrances and clearances at Hungarian ports was about 18,700 in 1897,

representing a tonnage of about 1,845,000. The home merchant marine included 502 vessels, of which all but 76 were coasting and fishing vessels and only 70 were steamers. Education is said to have progressed considerably since 1890, the statistics of which year showed about one-half the population to be illiterate. Attendance in the elementary schools is compulsory, and there are also gymnasia and other preparatory schools, colleges, and technical schools, and three universities. In 1896-97, of 3,270,755 children of school age, 2,437,330 attended school. About half of these were of the Hungarian (or Magyar) race. Other peoples in Hungary, whose population presents greater racial diversity than that of almost any other country, are principally Servian and Croatian (especially in Transylvania), German, Bohemian, Moravian and Slovak, Ruthenian, Roumanian, and Gypsies. The great variety of races is matched with an equally large number of religious sects, including Roman Catholics, Calvinists, Lutherans, Orthodox Greeks, Armenians, Unitarians, Israelites and Nazarenes, and others. The largest sect is the Roman Catholic, numbering about 9,000,000. Religion is entirely free, with perfect equality between all denominations, and great tolerance toward one another is shown. The upper clergy especially are said to be of marked liberalism. The Catholic clergy are said to resemble the American branch of the Roman Church in their enlightenment and the spirit of toleration which they display.

Government.—Hungary joined with Austria in 1867 to form the dual monarchy of Austria-Hungary under the common sovereignty of Franz Joseph, Emperor of Austria and King of Hungary, each country being under its own constitution a limited monarchy, with its own parliament. Legislation regarding common affairs is accomplished by the delegations, which are two in number, and consist each of sixty members, representing the legislatures of Austria and Hungary. Under the control of the delegations, which meet annually at Vienna and Budapest, are the executive departments of foreign affairs, war, and finance. Besides these, matters of interest common to the two parts of the monarchy are commerce, indirect taxation, coinage, railways, military and naval matters, and defence. Hungary's parliament, or diet, comprises an upper house, the house of magnates, and a lower house, the house of representatives. The former includes life peers, appointed by the crown; ex-officio members, who are state officers; certain dignitaries of the Roman Catholic and Orthodox Greek churches; representatives of the Protestant confessions; the archdukes, and three members from Croatia-Slavonia. The lower house is elective, voters being subject to a low property qualification, from which scientific and certain other professional classes are exempt. The diet has jurisdiction over Croatia-Slavonia, which has also its own provincial diet, in such matters as are the common concern of those provinces and Hungary. Transylvania is legislatively united with Hungary. The agreement known as the *Ausgleich* binds the two in respect to financial and commercial affairs and in respect to the quota to be paid for the common financial needs of the empire. This treaty expired in December, 1896. Hungary hoped to obtain a more favorable division of the contribution to the common expenses. After long negotiations, the treaty was provisionally extended. See AUSTRIA-HUNGARY.

Political Parties.—The chief political parties are the Liberals, the Independents, and the Nationalists, who vote sometimes with the Liberals and sometimes with the Independents. The Croatian delegates usually vote with the Liberals. The Hungarian People's party, formed in 1895, is anti-Semitic and anti-Liberal, and represents in general the Catholic opposition to Liberal measures. From 1895 until the early part of the year 1899 the Banffy ministry was in power. There were after the general elections of October, 1896, 282 Liberals, 37 Nationalists, and 48 Independents, or Kossuthists; but toward the end of the year 1898 there were signs of division in the Liberal majority, and in the early part of 1899 the Liberal support of the Banffy ministry failed completely and that ministry was overthrown.

Political Situation in 1899.—The Hungarian diet was in session from September 5, 1898, to March 1, 1899, during which not a single law was passed, with the exception of the memorial on the death of Queen Elizabeth, who had been assassinated at Geneva in 1898. The failure of legislative action was due to the obstructive tactics of the minority, which wasted the session in fruitless interpellations of the government. On December 21, 1898, the Austrian *Reichsrath* was dismissed, in order that the government might have a free hand to renew the *Ausgleich* by ordinance. The *Reichsrath* met again on January 17, 1899, but was prorogued by the government within two weeks. Baron Banffy made an arrangement with Count Thun, the Austrian premier, for a renewal of the *Ausgleich*. It was to be renewed by ordinance in Austria and by legislative action in Hungary, but the opposition in the Hungarian diet prevented the necessary laws from being passed. Not only this, but there was no action on the budget or on the military contingent. At last a manifesto, signed by 243 Liberals, and known as the *lex Tisza*, declared that the ministers should, in case of necessity, carry on the administration without legal

warrant. This measure led to a division in the Liberal party, many refusing to sign, but was heartily favored by Liberals outside the diet, who, although taxes were not legally collectible, voluntarily paid the imposts at the tax offices and in some cases paid them a year in advance. This state of affairs could not continue, and efforts were soon made to restore peace and make parliamentary action possible. This was accomplished after the resignation of Baron Banffy and three of his colleagues. The different parties having reached an agreement, accepted the ministry of Koloman de Szell (*q. v.*), who assumed office on March 1. It was understood that the obstructive tactics would be abandoned as soon as this minister came into power. He was regarded as the only prominent member of the diet whose ministry would allay the factional disputes. A final agreement on the *Ausgleich* with Austria was reached early in July. This agreement conceded to Hungary nearly all the points that she demanded. The *Ausgleich* was to be prolonged until 1907. The customs union between the two countries and the commercial treaties with foreign countries were to cease at that date. Hungary's quota for the imperial expenses was reduced. See the article AUSTRIA-HUNGARY.

HURLEY, DENNIS M., member of Congress, died at Hot Springs, Va., February 26, 1899. He was born in Limerick, Ireland, March 14, 1843; in 1850 he came to Brooklyn, N. Y., where he thereafter resided, except during the period 1854-66, when he lived in New York City. He learned the carpenter's trade and became a contractor. In 1881 and 1882 he was an unsuccessful candidate for member of assembly. In 1896 he was elected from the second district to the Fifth-fifth Congress as a Republican, and was re-elected to the Fifty-sixth Congress.

HUTCHINSON, BENJAMIN P., a well-known speculator and member of the Chicago Board of Trade, died at Lake Geneva, Wis., March 11, 1899. He was born at Lynn, Mass., in 1829. Chiefly by speculation in wheat he came into possession of a large fortune, but lost it, his financial overthrow coming finally with the failure of an attempted deal in 1891.

HYBRIDIZATION. See BIOLOGY.

HYDE, HENRY BALDWIN, founder and president of the Equitable Life Assurance Society of the United States, died in New York, May 2, 1899. He was born in Catskill, N. Y., February 15, 1834. In 1852 he was given a clerkship in the office of the Mutual Life Insurance Company of New York, of which his father was the New England manager. He became cashier, but in March, 1859, resigned for the purpose of organizing a new company. This was accomplished the following July, when the Equitable Society was incorporated, and Hyde was elected vice-president and general manager. Upon the death of President Alexander in 1874 Hyde succeeded him, and retained the position to the time of his death. It was well said that the history of the Equitable was the story of his life; and this history shows that he was "in a high sense a philanthropist and benefactor." A minute adopted upon his death by the directors of the Equitable contained the following: "His company, during its forty years of existence, has paid to those who trusted to it their savings for the safety of their families \$377,000,000, and it holds \$265,000,000 for its many policy-holders. This unparalleled result was the work of Henry B. Hyde. No fortune of \$200,000,000 was ever piled up in a single life. But our president, from the age of twenty-five to sixty-five, accumulated for the society \$572,000,000. This sum far exceeds the fortune of the most famous financiers." Although it was said that President Hyde received one of the largest salaries in the world, his private fortune amounted to only about \$500,000.

HYDE, General THOMAS W., a well-known American ship-builder, died at Old Point Comfort, Va., November 14, 1899. General Hyde achieved distinction both as a military man and as a marine architect and builder. His parents were natives of Bath, Me., but he was born in Florence, Italy, in 1841. He was graduated from Bowdoin College, and afterward from the old University of Chicago, becoming one of the first graduates in 1861. He fought throughout the Civil War, and was afterward granted a medal by Congress for exceptional bravery. Returning to Bath after the war, with the rank of brigadier-general of volunteers, he entered upon the business of ship-building. The Bath Iron Works, which he leased and ran with a small force, later developed into the "northern division" of the Bath Iron Works. The business developed to large proportions, and General Hyde became the principal owner and one of the best-known ship-builders in the United States. General Hyde served several terms in the State senate, of which he was president for two terms. He wrote *Following the Greek Cross, or Memories of the Sixth Army Corps*.

HYDRAULIC CEMENTS. The United States has grown within the last few years to occupy a place in the front rank of the cement-manufacturing countries of the world. In 1898, which is the last year for which definite figures are available, the

production, importation, and consumption of hydraulic cement in the United States were as follows:

ITEM.	No. Barrels of 400 Pounds.	Per Cent. of Total.
Natural rock cement.....	8,418,924	59.6
Imported Portland cement.....	2,012,318	14.36
American " ".....	3,692,284	26.14
Total consumption.....	14,125,086	100.00

It is estimated by competent authorities that the production of Portland cement in the United States in 1899 reached probably 5,000,000 barrels. The production of natural cement will not vary greatly from that of 1898 or, say, 8,500,000 barrels. Germany now produces annually about 18,000,000 barrels, practically all of which is Portland cement. England manufactures about 8,000,000 barrels of Portland cement each year, and France produces about 3,000,000 barrels of Portland cement, and 7,000,000 barrels of various other classes of hydraulic cement. Other European countries which manufacture hydraulic cement, mostly Portland cement, in smaller quantities, but which are yet large producers, are Russia, Belgium, Austria, and Scandinavia. Nearly every country where modern engineering work is carried on produces hydraulic cement to some extent. The accompanying table shows the principal centres of Portland cement manufactured in the United States:

STATE.	No. of Works.	Barrels.	STATE.	No. of Works.	Barrels.
California.....	1	50,000	Ohio.....	6	265,872
South Dakota.....	1	31,000	Pennsylvania.....	9	2,006,141
Indiana.....	1	2,500	Texas.....	1	8,000
Maryland.....	1	10,000	Utah.....	1	11,250
Michigan.....	2	77,000	Total.....	31	3,692,284
New York.....	1	554,358			
New Jersey.....	2	587,163			

Natural cement is made in 16 States by 76 factories, distributed as follows:

STATE.	No. of Works.	Barrels.	STATE.	No. of Works.	Barrels.
Florida.....	1	7,500	Pennsylvania.....	5	400,958
Georgia.....	1	18,000	Tennessee.....	1	10,000
Illinois.....	3	630,000	Texas.....	1	11,000
Indiana and Kentucky.....	19	2,040,000	Virginia.....	3	8,635
Kansas.....	2	180,000	West Virginia.....	1	42,874
Maryland.....	4	297,475	Wisconsin.....	1	379,973
Minnesota.....	2	129,436	Total.....	76	8,418,924
New York.....	29	4,157,917			
Ohio.....	3	26,724			

These figures are for the year ending December 31, 1898.

Hydraulic cement is one of the most important structural materials used by the engineer, and its use is constantly increasing. The principal use of cement by engineers is in the form of concrete, which is an artificial stone composed of cement, sand, and gravel or crushed stone. Concrete is made simply by mixing the aggregating material in the proper proportions with water and depositing the mixture in moulds or masses to harden, which it will do either in air or under water. It is

used for foundations for bridges and buildings, in the place of stone masonry, for walls, arch bridges, dams, fire-proofing, and for a great variety of other purposes.

Classification.—Portland cement is the product obtained by calcining to incipient vitrification an intimate artificial admixture of two or more raw materials, consisting principally of lime, silica, and alumina (limestone and clay), the product then being ground fine. Natural cement is the product attained by calcining at a low temperature a natural limestone of a certain suitable composition and finely grinding the clinker. Puzzolana is a term applied to a combination of silica and alumina, which, when mixed with the common lime, and made into mortar, has the property of hardening under water.

Development of Manufacture.—Natural cement was first manufactured in England in 1796 by James Parker. Joseph Aspdin, of Yorkshire, England, invented Portland cement in 1824, and began its manufacture, commercially, about the same year. Portland cement began to be manufactured on a commercial basis in France in 1846, and natural cement some twenty or twenty-five years before. Portland cement was manufactured in Austria in 1850, in Germany in 1855, in Russia in 1857, and in the other continental European countries at various dates between 1850 and 1870. Natural cement was first manufactured in the United States in 1818, and Portland cement in 1872. Puzzolana was used by the Romans in their early engineering works, and is yet made in Italy and Greece, and in the Rhine valley in Germany.

Process of Manufacture.—The principal constituents of Portland cement are lime, alumina, and silica. The natural materials which supply the lime for cement-making are limestone and chalk or marl; those which supply the alumina are clay or shale. The lime and clay materials are first mixed intimately in a powdered form. Where marls, or chalks and soft clays, which can be easily dissolved in water, are employed, the mixing is done by the wet process. Where hard limestone and shales are employed, the mixing is done by the dry process. Mixing by the wet process consists in agitating the proper proportions of marl and chalk and clay with water in a wash-mill, from which the resulting creamy fluid is conveyed to large, shallow settling-basins, where the solid matter settles and the water is decanted and evaporated off. The sludge of the settling-basins is taken to drying-floors or drying-chambers and thoroughly dried. In the dry process the hard limestone and shales are mixed and ground dry to a fine powder by millstones or some other form of grinding machinery, and the powder is wetted and made into bricks, which are then dried on drying-floors or in drying-chambers. The semi-wet process is a modification of the wet process in which the mixture is accomplished in pug-mills with a smaller proportion of water, and the paste is conveyed directly to the dryers, no settling-basins being employed. Many factories also use a combination of the wet and dry process, one material being reduced to powder by water and the other ground dry, and the mixing done afterward. The proportions in which the lime and clay materials are mixed are carefully regulated by chemical analysis.

After being dried the mixture is burnt at a temperature approximating 2000° F. in kilns. These kilns are of four types, (1) intermittent kilns, (2) chamber kilns, (3) continuous kilns, and (4) rotary kilns. Intermittent kilns are bottle-shaped structures of masonry, which are filled with alternate layers of raw mixture and fuel, which is usually coke, although coal is sometimes employed. When full the kiln is fired and it burns until the fuel is all consumed, after which the contents are allowed to cool off and the calcined clinker is withdrawn and the kiln is filled with a new charge. The chamber kiln is a modification of the bottle kiln in which a horizontal chamber takes the place of the vertical chimney. This chamber is used for drying the wet raw mixture by the waste heat given off from the burning kiln. Continuous kilns are of various form, but they are all so designed that the burning is continuous, the burnt clinker being regularly removed at the bottom and raw material and fuel being added at the top to take its place. The rotary kiln is an American development, and consists of a sheet-iron cylinder lined with firebrick and mounted at a slight inclination from the horizontal. The raw mixture, either dry or wet, is fed by a spout into the upper end of the cylinder and gradually works its way to the other end, owing to the rotation of the cylinder, which is accomplished by suitable power mechanism. The heat for calcination is supplied by burners using gas, oil, or powdered coal fuel, which are placed at the lower end of the cylinder. About 60 per cent. of the Portland cement made in America is calcined in rotary kilns. They are not used outside of America.

The burned or calcined cement clinker is a hard, greenish-black substance having a very porous texture. As produced by all but rotary kilns, it is in quite large lumps, and previous to grinding has to be crushed in crushers of the jaw or rotary type, such as are commonly used for crushing stones for road materials. The clinker from rotary kilns is comparatively small, and does not usually require crushing previous to grinding. For grinding, ordinary millstones are used extensively,

particularly in Europe. The other common forms of mills are edge-runner mills, whose essential characteristic is a series of heavy rolls which travel on a metal track and crush the clinker by riding over it as a wagon-wheel crushes the pebbles on a road, and ball-mills, which are of two principal types. One type of ball-mill operates similarly to the edge runner-mills just described, except that heavy balls take the place of rolls, and the other type consists of a metal cylinder lined with hardened metal or tile plates and partly filled with small balls or flint pebbles. The clinker is run into the cylinder, which is made to rotate so that the tumbling and rolling of the balls grind it to powder. The powder from these mills is sifted to exclude the coarser particles, which are reground, and the sifted powder is packed in barrels or bags for shipment to the consumer. Many of the best Portland cements are now ground so fine that they leave a residue of only from 1 per cent. to 5 per cent. of the total on a sieve having 10,000 meshes per square inch, and from 60 per cent. to 70 per cent. of which will pass a sieve having 40,000 meshes per square inch.

In manufacturing natural cement the rock is broken by blasting into small fragments, which are burned in continuous kilns of the kind commonly used for burning lime. The crushing, grinding, and sifting processes are conducted exactly as in the manufacture of Portland cement.

Puzzolanic cements are made by mixing certain natural and artificial puzzolanas in powdered form with slack lime. Natural puzzolanas are volcanic lifters of certain composition which are found most plentifully in Italy, Greece, and the Rhine valley near Cologne, in Germany. The most important artificial puzzolana is the slag from blast furnaces, and cements made from it are called slag cements. Slag cements are made in America, but the manufacture of natural puzzolanic cements is confined practically to continental Europe.

HYGIENE. The twenty-fourth (German) Congress for Public Hygiene was held at Nuremberg, September 13 and 14, 1899. Of the membership of 1560, 286 people were present. The subjects discussed were: (1) Artificial light, (2) the need of greater cleanliness in the handling of food materials, and (3) the school physician. To the last topic one whole day's session was devoted. The school physician's work should include, it was argued, the sanitation of the building, and the hygiene of the eyes, ears, nerves, and teeth of the children, while instruction in hygiene should receive special attention.

Hygiene of School-life.—An active discussion of the condition of the school children in Washington, D. C., has led to the publication by the Government Printing Office of a report of a committee of investigation, which contains many valuable suggestions. In it Dr. W. W. Johnston makes the following recommendations:

"1. All investigations made into the health of school children in this country or in Europe show that a large percentage present signs of ill-health.

"2. Departures from health in school children are primarily and chiefly in the nervous system and in the eye, although the general nutrition, the blood-making processes, and the digestion are also disordered.

"3. The same conditions of disease are seen in different countries and climates, and are so uniformly associated with school-life that there is a reasonable presumption of a close relation between school instruction and these disorders.

"4. The facts show that there is a progressive increase in the sum total of disease with advance from class to class; that the percentage of disease varies also with the number of hours devoted to study and with the extent to which the brain of the pupil is taxed.

"5. Careful observations show that during the first eight years of life the brain is rapidly growing in weight and size and complexity of structure; that after eight years there is but little further increase in the size and development of the brain. The first eight years, therefore, demand such a degree of rest of the brain as will best favor its growth and avoid overstrain of an immature organ. The premature strain put upon a growing organ, as yet unfit to perform its function, hinders its proper development, and brings about disorder in the function or disease of the organ.

"6. The beginning of school instruction before the age of eight years is one of the causes of the prevalence of disease among school children. The rapidly progressive deterioration in the eye shows how injurious is the overstrain of an immature organ, and the progressive increase of the so-called 'school diseases' show the effect of continued strain upon the nervous system of the young.

"7. Another cause of disease is the admission of children who are physically and mentally unfit to begin school instruction or who cannot bear the restraints of school-life. Overstrain of an enfeebled nervous system quickly causes disease.

"8. The remedies suggested by these considerations are the fixing of eight years as the proper age to begin school instruction, instead of from four to six years, as at present permitted, and the demand for a proper medical certification as to the fitness—mental and physical—of each child who seeks admission to the schools."

In Philadelphia the Board of Health began to inspect schools by means of a corps of fifteen assistant medical inspectors in June, 1898, adopting, though on a very small scale, the system in use in New York City for many years. During the thirteen weeks ending February 1, 1899, more than 1000 cases of disease were reported from the Philadelphia public schools, principally skin diseases, inflammations of the ear, and diseases of nose and throat and lungs. The New York Institution for the Blind states that there has been a steady decrease in the number of blind children in that city for the past twelve years, or since active steps have been taken to prevent indiscriminate use of towels and wash basins in homes for children, and to secure periodical medical inspection. In the last census the figures given regarding blindness were as follows: One blind person to every 2500 of the population in the counties of New York and Kings (the latter including Brooklyn); while in Alleghany, Clinton, Oswego, Madison, and Schuyler—all rural counties—there is one blind person for every 650 of the population. The city council of Würzburg, Bavaria, took action in 1899 to provide free attention to the teeth of school children. It is contemplated to care for diseases of nose and throat similarly, if the experiment proves of avail.

Hygiene and Drinking Water.—Water-filtration is employed in Liverpool. A regular examination is made every two weeks of the condition of the water with regard to pathogenic bacteria. Examinations are also made of the filter beds, and of the water standing in "dead ends" of mains. In all cases the water has been found free from contamination and from harmful bacteria. Tests have been made during a long series of experiments in Rome, during 1899, with a number of agents by which the sterilization of drinking water may be accomplished. Tincture of iodine has been used, as well as ozone. The Bergé process consists in treating the water with chlorine peroxide, a powerful and energetic oxidant and a searching bactericide. Three grammes of chlorine peroxide will sterilize completely a cubic metre of water, at a cost of less than half a centime. Professor Henry Bergé is lecturer on chemical technology at the Brussels Polytechnic School.

Hygiene of the Barber Shop.—The Pennsylvania Board of Health recently issued a tract entitled *Hygienic Hints for Barbers and Hairdressers*. Persons suffering from contagious disease, or nursing cases of contagious disease at home, should not act as barbers. The shop and the instruments and towels should be kept scrupulously clean. Persons afflicted with communicable disease should not be allowed in barber shops, but should be attended at home, and instruments used on them should be disinfected. Customers should be urged to provide their own instruments and brushes. Razors and clippers may be disinfected by boiling in alkaline water; brushes, combs, and strops, by subjecting them to formalin vapor; shaving brushes by boiling. Powder puffs should be abandoned. Alum lumps should not be used on a second customer. Vaseline should be removed from the jar with a spatula. Sponges should never be employed. Careful sweeping and ventilation should be practised.

Hygiene and Tenement-House Reform.—The recommendations of the Tenement House Committee of the Charity Organization Society of New York City, in order to secure reform in the erection and construction of tenement houses, are as follows: "That in all new tenement houses no air-shaft should be less than 6 feet wide in any part, nor less than 150 square feet in superficial area; that no new tenement house should exceed 6 stories in height unless it be fire-proof; that all living rooms in tenement houses should have a capacity of at least 600 cubic feet of air-space; that for every new tenement house containing 20 families or more there should be provided at least one bath tub or shower bath in a separate apartment for the use of the tenants and when there are more than 20 families in any such house there should be provided additional bath tubs; that every tenement house hereafter erected or altered, 4 stories or more in height, should have the first story made fire-proof; that the walls of all tenement houses hereafter erected should be carried up 3 ft. 6 in. above the roof on all four sides, so that the roof might be used as a playground; that no wooden building of any kind whatever should be placed on the same lot with a tenement house within the fire-limits of the city; that in every new tenement house the stairway connecting the cellar with the first floor should *not* be located in whole or in part underneath the stairs leading from the first story to the upper stories; that no closet should be constructed underneath any staircase in any tenement house; that every new tenement house and every existing tenement house in which the halls are not light enough in the daytime on all floors to permit an ordinary person to read easily without aid of artificial light should have every door leading from the public halls to rooms provided with ground-glass panels of an area of not less than 6 square feet; that in every new tenement house all interior shafts should be fire-proof and provided with fire-proof self-closing doors to all openings; that the following provisions of the existing building laws be continued in effect—namely, that the bulk-head doors of all tenement houses should at no time be locked, but they might be fastened on the inside with a hook or bolt; that in all tenement houses where wooden stud partitions rest over each other, the space between the studs should be filled in

solid with fire-proof material, to prevent the spread of fire from floor to floor; that the cellar floor of every tenement should be covered with concrete not less than 3 inches thick; and that when a kitchen range or stove is placed within 12 inches of a wooden stud partition the woodwork should be cut away and filled in with fire-proof material."

Practical Instruction in Public Hygiene.—The Chicago Department of Health has offered graduates in medicine and senior undergraduates courses of practical instruction and work in sanitary science and public hygiene. Applicants must pass a preliminary examination in physics, chemistry, bacteriology, and biology. The course for graduates covers three hours daily for two weeks each in general bacteriological work, bacterial diagnosis of disease, chemical analysis and bacteriological examination of water, ice, and food, with special work in the examination of milk. Certificates of proficiency will be given to those whose work is satisfactory and whose qualifications are determined. The course for undergraduates consists of one term of four weeks, three hours a day, in preparing culture media and culture outfits, in incubation, sterilization, and the care and use of instruments and apparatus. On completing the course satisfactorily the students receive certificates, on which they may enter the advanced course without examination. The department also offers special courses in sanitary inspection, the registration of vital statistics, and in methods of dealing with contagious diseases and of disinfection. Lighting, plumbing, drainage, ventilation, and the removal of waste receive attention in the special courses, as well as vaccination, the preparation of glycerinated lymph, the use of diphtheria-antitoxin, and formaldehyde disinfection. It is now announced that the experiment, now two years old, of offering these courses, has proved very successful.

Legislation.—In June, 1899, a special commission composed of officers of several departments of the city of Norfolk, Va., recommended to city councils the adoption of an ordinance prohibiting expectoration on the sidewalks, in public halls, street cars, reception rooms, etc. The penalty for infraction of this ordinance is to be a fine of from \$1 to \$5 for each offence.

HYLTON, Second Baron, HEDWORTH HYLTON JOLLIFFE, died October 30, 1899. Born at Merstham, June 23, 1829, he was educated at Eton and at Oriel College, Oxford. He entered the Fourth Light Dragoons, and for his service in the Crimea received several decorations. He took part in the charge at Balaclava. From 1856 to 1858 he was a Conservative member of Parliament from Wells, retiring when in the latter year Wells was disfranchised pursuant to the Reform bill. His heir was his son, H. George Jolliffe, M.P.

HYPNOTISM. During 1899 many marvellous stories of cures by hypnotism have been exploited in the sensational newspapers, absurd claims have been made, and impossibilities asserted. Authentic reports by scientific investigators have been published largely in scientific publications, which show that the field in which hypnotism is available is smaller than most people believe. Cases of cure of morphinism, chloralism, nicotinism, dipsomania, and kleptomania have been reported, but in the large majority of instances sufficient time has not elapsed to judge of the resultant condition after the use of suggestion. Claims of cures dependent upon change or removal of pathological conditions are viewed with suspicion. The present status of the therapeutic value of hypnotism is stated in the following excerpt from the *Philadelphia Medical Journal*, for March 4, 1899: "It is highly desirable at the present day that a distinction should be drawn between hypnosis as a psychic state and hypnotism as a therapeutic method. We wish to emphasize this point, because a great part of the discredit into which hypnotism has fallen is due to the abuse and exaggeration of its powers as a medium of healing. The two aspects of the subject are entirely distinct. Hypnosis is a genuine physiological phenomenon—not nearly so common and attainable, however, as some observers claim—and it presents some most interesting and recondite problems in psychology. We think this much is certain, and is generally accepted as a fact. Moreover, this state of hypnosis yet requires the conscientious and critical study of experts in psychology, and suffers because it is still too much abandoned to the dilettanti of science and literature. The theory of hypnosis, in other words, is still an open field for profitable research.

"Unfortunately, under the influence of certain sensational writers in France, hypnotism has been exploited beyond all reason as a means of healing. This aspect of the subject seems to be the only one that has importance in the eyes of some enthusiasts. This has led perilously near to charlatanism in some cases, and in others has blinded some sincere but zealous practitioners. We are far, however, from denying that hypnosis sometimes opens an avenue of approach to a patient's mind by which most salutary suggestions may be introduced and made operative.

"The healing power of hypnotism may be expressed in an aphorism: Hypnosis prepares the soil for suggestion. It does this and nothing more; and, in fact, can do nothing more. Consequently, the only therapeutics possible under hypnosis is by

mental impression, and the only diseases curable are those that can be influenced by the mind. Reduced thus to its baldest expression, hypnotism presents nothing miraculous or unintelligible. Hypnotism will not cure organic disease or eradicate microbes from the blood. The ritualism employed, the scholastic distinctions and definitions used, only cloud and confuse the subject.

"This should remind practitioners of hypnotism of two things. First, there is a *normal* suggestibility of mind that is often just as useful as, and sometimes even more so than, the artificial state provoked by hypnosis. All wise practitioners use this normal suggestion whenever they are able—it simply denotes the influence of mind upon mind, and of mind upon body. Second, the susceptibility to hypnotism, and to cures wrought in this state, is often not a good prognostic sign. What we mean is this: An hysterical or neurasthenic patient who is readily hypnotized and cured, shows by this very fact that she is a confirmed neurotic. Her ready hypnosis is a sign of her degeneration. Her permanent cure is by no means assured—her relapse is often merely a question of time." See SUGGESTION.

ICE-BOATING. See ICE-YACHTING.

ICE-HOCKEY. Ice-hockey in America, as a scientific sport, is a development of the last few years, and has become especially prominent since the building of artificial ice-skating rinks, where suitable training and exhibition quarters are assured during all weather conditions. These rinks have practically brought into existence the prominent teams of New York City, and the matches played there by club and college teams are offered as one of their principal attractions. The Amateur Hockey League, composed of the New York Athletic Club, Crescent Athletic Club, Brooklyn Skating Club, St. Nicholas Club, Montclair Athletic Club, and the Hockey Club of New York, played its championship series for the year 1898-99 in the St. Nicholas and Clermont rinks, in the boroughs of Manhattan and Brooklyn, N. Y. City. The Brooklyn Skating Club won the title by 8 won games and none lost, and 43 won goals and 9 goals against them. The Hockey Club was second, with 5 games won. The Intercollegiate Hockey League, formed during the season of 1898-99, with Yale, Brown, Columbia, and Pennsylvania, played its games in the ice rinks of New York and Philadelphia, Yale winning the series for 1898-99 by 3 won games, none lost, 10 goals scored and 4 against. Pennsylvania was second, with 2 out of 3 games. In March, 1899, the Victoria team, of Montreal, defeated the New York team by a small score. In December the McGill University team was defeated in New York by the N. Y. A. C. team, 1 to 0, and by an all-American team, composed of players from the New York Athletic, St. Nicholas Skating, and New York Hockey clubs, the score being 10 to 6. The games were hard fought.

ICELAND is a large island of volcanic origin, lying in the North Atlantic Ocean, about 130 miles east of Greenland; it has an area of about 39,756 square miles, being somewhat larger than Ireland, and a population estimated in 1899 at 75,663. The capital is Reykjavik, a city of about 5000 inhabitants. It is believed that the climate of Iceland has changed greatly since the first settlement of the island, which is at present a bleak and almost treeless land. In recent years there has been a considerable emigration, which has lately been directed largely toward Manitoba. There are minerals of some value in Iceland, but they have not been worked to any extent, and as manufactures are entirely of a domestic nature the imports are largely confined to the necessities of life. Besides foodstuffs and clothing, the principal imports are timber, for building; hardware, tobacco and spirits. Exports include principally wool, cattle, ponies, and fish, and in addition may be mentioned Iceland moss, seal-skins, oil, sulphur, eider-down, and bird skins.

ICE-YACHTING. The sport of ice-boating is necessarily confined to a few, but as one of the most distinctive and characteristic of American sports it occupies an important place. Its rise and progress, as sketched in this article, have brought it with the close of the year 1899 to a high degree of development among the scientific sports. On the Hudson River, whose name has long been associated with the building and sailing of famous water-yachts, both steam and sail, and with notable amateur and professional sculling and oared-crew races and regattas, is found the home and original centre of skating and ice-yachting. The Hudson River and the Orange Lake ice-yacht clubs, with the Shrewsbury River clubs, have made the name of America a formidable one to winter sportsmen abroad. The Hudson River models have been adopted among ice-yachtsmen throughout the country, and are, according to reports for the winter opening in December, 1899, being bought and shipped West in unprecedented numbers for the ensuing season. One of the newest organizations in this sport, the Irondequoit Ice-Yacht Club, of Rochester, N. Y., is but one of many which have adopted also the Hudson River rules, with the Orange Lake time allowances for mixed classes. But the spread of the sport has long included localities far removed from the limits of New York State. The list of

clubs prominent in the season of 1898-99 is a large one, and has shown a marked increase for the season of 1899-1900. In the West the sport has had a remarkable growth, especially among the lakes of Michigan, Wisconsin, and Minnesota. Sportsmen at Winnebago Lake, Wis., have over 100 ice-boats. The most prominent organization is the Oshkosh I. Y. Club. The principal trophies are the *Evening Wisconsin* cup, the Oshkosh cup, and the Oshkosh club pennant. The most rapid development among Western clubs has been made by the Lake Minnetonka I. Y. C., with a new club-house and over 35 large yachts. Lake Minnetonka has seen famous rowing regattas in the past and bids fair to become a centre also of winter sports. The Lake St. Clair (Detroit) and Kalamazoo clubs, of Michigan (the latter the pennant holder of Gull Lake) and Lake Pepin, Wis., and White Bear Lake, Minn., organizations, are among other active Western ice-yachting clubs. At Madison, Wis., Lakes Mendota and Monona have many ice-yachtsmen. Still more a centre of ice-yachting in Wisconsin is Lac la Belle. There is a triangular three-mile course on this lake, the race being three times around, plus tacks. It is reported that early in 1900 the *Expense*, Commodore Thompson, established a new record for the region west of the Hudson by sailing this course in 14 minutes, a distance of 12 miles, counting the course covered in working to windward. Scores of other organizations were active during the year, from Bar Harbor through Lakes Champlain and George to the far Western lake region.

The principal races of 1899 occurred about January. The ice-yachting championship pennant of America and the world, a trophy comparable to the *America's* cup in the eyes of ice-yachting sportsmen, was again won on the Hudson River by John A. Roosevelt's *Icele*; second, *Jack Frost*; third, *Santa Claus*. Western sportsmen are casting longing eyes toward this pennant, and there was talk of sending East as a competitor in 1900 the *Irene*, the holder of the northwestern championship pennant. The race for the latter pennant will be sailed, 1900, on Lake Minnetonka, and the Hudson River Ice-Yacht Club signified its intention of sending the *Icele* or some other club flyer to compete in the race. These two proposals are the first serious considerations yet given toward any prominent Eastern-Western regattas in ice-yachting. There is an international trophy, however, in the Walker cup, won by the Kingston Club last year by victories over boats representing the Cape Vincent (N. Y.) I. Y. C., at Kingston, Ontario. At Orange Lake the Higginson cup was won by the *Snowdrift*, which won also the Van Nostrand cup and the Kidd championship pennant, in the last two races the *Cold Wave* and *Arctic* being second and third, respectively.

ICHTHYOLOGY. See FISH AND FISHERIES.

IDAHO, a northwestern State of the United States, has a land area of 84,200 square miles. The capital is Boise City. Idaho was admitted to the Union, July 3, 1890.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Wheat, 3,440,103 bushels, value, \$1,720,052; oats, 1,099,968, \$417,988; barley, 405,510, \$186,535; potatoes, 593,960, \$362,316; and hay, 539,895 tons, \$3,401,338. Farm animals, January 1, 1900, comprised horses, 127,821, \$2,863,504; mules, 889, \$32,810; milch cows, 33,075, \$1,055,092; other cattle, 364,853, \$8,672,748; and sheep, 2,658,662, \$7,444,254.

Mineralogy.—Completed reports for the calendar year 1898 showed an output of gold valued at \$1,716,900, and of silver, 5,073,800 fine ounces, of a commercial value of \$2,993,542. As in other mineral sections, Idaho received much attention during 1899 from copper developers. Work was undertaken on several large copper ledges on North Boise River, east of Idaho City, and on a number of newly discovered gold and copper quartz ledges on Little Salmon River, between Salubria and Grangeville. The extension of the railroad into the Seven Devils country attracted a considerable rush of prospectors, for the mountains extending north and south through Washington County are known to contain much undeveloped mineral wealth. In this district an immense graphite deposit was discovered. About 25 miles east of Idaho City a rich cinnabar ledge was found, which, besides being high grade in quicksilver, contains a profitable proportion of gold; and on Salmon River, not far from Bear Valley, a new ledge was struck, rich in gold, carrying telluride and mercury, and holding considerable native quicksilver. The old State wagon road from Banner to Cape Horn, which had become impassable, and which was the only means of reaching central Idaho, was put into repair, and a new one was constructed from Idaho City to the telluride mines on Badger Creek.

Banks.—On October 31, 1899, there were 9 national banks in operation and 5 in liquidation. The active capital aggregated \$550,000; circulation, \$165,153; deposits, \$3,555,450; and reserve, \$1,397,853. The State banks, June 30, 1899, numbered 7, and had capital, \$172,165; deposits, \$524,007; and resources, \$742,967.

Education.—At the close of the school year 1897-98 the school population was 47,960; enrolment in public schools, 29,737; and average daily attendance, 21,528.

There were 848 teachers, 648 buildings used as school-houses, and public school property valued at \$597,718. The revenue was \$296,846; expenditure, \$274,377, of which \$205,849 was for teachers' salaries. There were 6 public high schools, with 23 teachers and 346 students; 7 private secondary schools, with 17 teachers and 176 secondary students and 522 elementary pupils; and 2 public normal schools, with 9 teachers and 124 students. The State University at Moscow reported 21 professors and instructors, 248 students, 5000 volumes in the library, \$35,000 invested in scientific apparatus and \$130,000 in grounds and buildings, and \$45,680 in total income. In 1899 there were 74 periodicals, of which 5 were dailies, 3 semi-weeklies, 62 weeklies, and 3 monthlies.

Railways.—During the calendar year 1898 the new railway construction amounted to 21.09 miles, and during 1899, 164.26 miles, giving the State a total mileage of 1283.15.

Finances.—In 1899 the assessed property valuations aggregated \$46,548,313, an increase in a year of \$16,124,642; the tax rate (1898) was \$8.31 per \$1000; total bonded debt, \$393,000, and floating debt, \$204,469. The greater part of the bonded debt was incurred for building wagon roads.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 180,000.

Legislation.—All the laws made by the legislatures since the admission of the State in 1890 were re-enacted during the lengthy session of 1899, because they had not had the different readings required by the constitution. Among the more important of the new laws enacted are to be noted: The appointment of a State engineer to inspect dams and dikes; the appointment of a game warden, with stringent protective provisions; the creation of a State board of examiners to examine and license physicians and surgeons, and another State board of examiners for dentists; a State board of horticultural inspection, with power of inspection of all fruit orchards and nurseries; a bureau of immigration, labor and statistics; a State board of arbitration, and a State inspector of mines, with much power invested in him. In civil actions hereafter verdicts may be rendered by three-fourths and in misdemeanor by five-sixths of a jury of twelve. In the interests of labor, eight hours were made a day's labor on public works; and employees are prohibited from making any agreement with employers not to become or continue a member of a labor organization, under penalty of fine or imprisonment. Employers of labor on railroads, ditches, buildings, and in mines must record and publish names of owners and agents, times when workmen are to be paid, and statements of all mortgages and liens. Police officers cannot be brought into the State and specially deputized. The State appropriated \$150,000 to build a wagon road, and a commission was appointed to supervise the same. A State board of public instruction and a State board of text-book commissioners were also created.

The Wardner Riots.—On April 24, 1899, the Wardner Miners' Union demanded of the Bunker Hill and Sullivan Company \$3.50 per day for all men in their employ working underground, and that they should employ no non-union miners. The superintendent agreed to pay the wages demanded, but refused to discharge non-union miners. On April 29 the Bunker Hill and Sullivan mill was blown up by means of sixty 50-pound boxes of dynamite, about 1000 men taking part in the riot. Property worth \$250,000 was destroyed, and one man was killed. The following day the State authorities, aided by federal troops under General Merriam, stood guard in the Cœur d'Alene mining district. On May 8 Governor Steunenberg proclaimed the district under martial law. Nearly 400 arrests were made for the fatal rioting at Wardner, and a prison known as the "bull pen" was hastily constructed. This at one time contained as many as 250 arrested persons. Eight men were indicted as ringleaders. The first trial was that of Paul Corcoran, financial secretary of the Miners' Union at Burke. The verdict rendered in his case, July 29, was murder in the second degree. He was sentenced to seventeen years' imprisonment. In the meantime miners had left the country in such numbers that every mill in the district had closed down; for when the governor proclaimed the district under martial law he also forbade mine owners, during its continuance, to employ members of organizations which had shown themselves criminal in purpose. Consequently, men belonging to such unions had to renounce their allegiance to them before they could be employed. The mill that was destroyed has been rebuilt and provided with an armor-lined blockhouse.

State Officers and National Representatives.—Governor, Frank Steunenberg; lieutenant-governor, J. H. Hutchinson; secretary of state, M. Patrie; treasurer, L. C. Rice; auditor, B. Sinclair; attorney-general, S. H. Hays; superintendent of public instruction, P. French; adjutant-general, J. L. Weaver; State engineer, D. W. Ross. Supreme Court: Chief justice, J. W. Houston; associate justices, I. N. Sullivan, Ralph P. Quarries; clerk, Solomon Hasbrouck. The State legislature consists of 27 Democrats, 9 Populists, 20 Republicans and 14 Silver Republicans. Senators:

George L. Shoup (Rep.), from Boise, and Henry Heitfeld (Pop.), from Lewiston. Representative: Edgar Wilson (Sil.), from Boise.

ILLINOIS, a central State of the United States, has an area of 56,650 square miles. The capital is Springfield. Illinois was admitted to the Union December 3, 1818.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 247,150,332 bushels, value, \$64,259,086; wheat, 12,665,410, \$7,979,208; oats, 127,278,948, \$28,001,369; barley, 395,502, \$185,886; rye, 1,154,325, \$542,533; buckwheat, 71,430, \$41,429; potatoes, 15,648,192, \$6,415,759; and hay, 2,365,710 tons, \$18,334,252. Live stock, January 1, 1900, comprised horses, 983,233, \$48,486,673; mules, 78,936, \$4,245,658; milch cows, 1,021,236, \$37,070,867; other cattle, 1,303,018, \$41,197,518; and sheep, 637,719, \$2,532,383.

Industries.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$47,359,523, the largest amount paid in any State. There were 406 manufacturers of tobacco, and 2960 of cigars, and the total output was 245,333,666 cigars, 2,183,110 cigarettes, 750,752 pounds of plug tobacco, 2,789,996 pounds of fine cut, 8,163,098 pounds of smoking, and 494,164 pounds of snuff. Grain and fruit distilleries in operation numbered 23; the production of fruit brandy was 861 gallons; amount of spirits rectified, 6,283,520 gallons; distilled spirits gauged, 78,869,366 gallons; production of fermented liquors, 3,549,534 barrels; and production of oleomargarine, 38,897,603 pounds. Reports for the calendar year 1898 showed an output of coal from 329 mines of 18,599,290 short tons, valued at \$14,567,598, a decrease from the output of the previous year of 1,473,459 tons, due to strikes. The principal quarry product was limestone, to the value of \$1,421,072. Manufactures of pig-iron aggregated 1,365,898 long tons; of Bessemer steel ingots, 1,105,040 long tons; of open-hearth steel, 183,103 long tons; and of all kinds of rolled iron and steel, 1,071,327 long tons.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the port of Chicago aggregated in value \$12,153,814, an increase in a year of \$2,012,401; and the exports, \$7,674,812, an increase of \$185,926. The movement of gold and silver coin and bullion was, imports, \$83,209; exports, none, making the total foreign trade of the year \$19,913,835, a gain of \$2,267,999. During the month of June, 1899, the tonnage of the vessels engaged in the foreign trade of the port was: Entered, American, 30,097; foreign, 2666; total, 32,763; cleared, American, 34,486; foreign, 2666; total, 37,152; grand total, 69,915. Of the total American tonnage, 59,953 was steam, and of the total foreign, 2070.

Railroads.—The new railroad construction in the calendar year 1898 amounted to 24.15 miles, and in 1899 to 126.30 miles, giving the State, according to one official report, a total mileage of 10,941.36, and enabling her to maintain the first place in steam railroad mileage. In the construction work of 1899, the Illinois Central led all the railroads in the country, completing 64 miles for new lines in Mississippi and other States, and making the total mileage operated by it 3864. The Chicago, Rock Island and Pacific built 49 miles of new lines, making the total controlled by it 3617.

Banks.—On October 31, 1899, there were 218 national banks in operation and 96 in liquidation. The active capital aggregated \$35,771,000; circulation, \$8,987,822; deposits, \$222,245,054; and reserve, \$62,453,955. The State banks, July 1, 1899, numbered 148, and had capital, \$16,708,000; deposits, \$155,185,881; and resources, \$198,658,082; and private banks, 100, with capital, \$1,844,884; deposits, \$8,926,490; and resources, \$11,498,673. The exchanges at the United States clearing-houses at Chicago, Peoria, and Rockford in the year ending September 30, 1899, aggregated \$6,477,829,256, an increase of \$1,028,997,283 in a year.

Education.—At the close of the school year 1897-98, the school population was 1,525,442; enrolment in public schools, 939,163, and average daily attendance, 729,227. There were 25,267 teachers, 12,740 buildings used as school-houses; and public school property valued at \$43,705,943. The revenue was \$17,463,396; expenditure, \$16,468,055, of which \$10,939,318 was for teachers' salaries. There were 328 public high schools, with 1267 secondary teachers, 35,068 secondary students, and 3256 elementary pupils; 62 private secondary schools, with 349 teachers, 4022 secondary students, and 3630 elementary pupils; 3 public normal schools, with 82 teachers and 2848 students in all departments; and 9 private ones, with 107 teachers and 2631 students. Normal training was also given in 12 colleges and 17 public high schools. Thirty-one colleges and universities for men and for both sexes reported 81 fellowships, 295 scholarships, 1206 professors and instructors, 13,787 students, 601,050 volumes in the libraries, valued at \$533,720; \$565,580 invested in scientific apparatus, \$8,073,235 in grounds and buildings, and \$10,499,217 in productive funds; \$1,613,185 in total income; and \$553,204 in benefactions. Four colleges for women reported together 1 fellowship, 2 scholarships, 58 professors and instructors, 533 students, 11,850 volumes in the libraries, \$6500 invested in scientific apparatus, \$360,000 in grounds and buildings, and \$57,880 in productive funds, \$90,856 in total income, and \$14,350

in benefactions. In 1899 there were 1732 periodicals, of which 181 were dailies, 1152 weeklies, 293 monthlies, and 20 quarterlies.

Finances.—The total assessed valuation in 1898 was \$772,431,976, a reduction in a year of \$23,938,642; tax rate, \$5.60 per \$1000; debt, none, excepting \$18,500 in bonds probably lost. Hereafter real estate is to be assessed every four years instead of annually, and property will be appraised at full value and assessed at one-fifth thereof.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 4,785,000.

Municipal Ownership.—The biennial report of the State Bureau of Statistics of Labor, issued at the close of 1899, contains an interesting comparison of some of the results of municipal and private ownership of public utilities. The report treats particularly of electric light and power plants, and waterworks in the cities and towns of the State, and, incidentally, of the cost and production of gas, which is supplied throughout the State by private corporations. According to the statements and figures given, where plants are owned and operated by municipalities the service is in the main much cheaper and more satisfactory. Municipal plants cost less for general expenses, repairs, and renewals, and more for wages and supplies. The report also shows that there are in the State 57 gas plants, all under private ownership; 236 electric light and power plants, of which 197 are under private and 39 under municipal ownership; and 165 waterworks plants, of which 35 are under private and 130 under municipal ownership.

Municipal Affairs.—Carter H. Harrison (*q. v.*) was re-elected mayor of Chicago, April 4, by 149,000 votes. It is estimated that from 20,000 to 40,000 independent Republicans voted for Mr. Harrison on account of his record as the champion of popular rights against the recent attempts of the street-railway combination to buy the city council. Ex-Governor John P. Altgeld was the candidate of the free-silver wing of the Democracy, and received 46,000 votes. His candidacy was designed to affect the national rather than the local political situation, and represented a protest against the supposed combination between Mr. Harrison and Mr. Richard Croker, the Tammany Hall leader, for control of the Democratic National Convention in 1900; it combined with the Chicago platform of 1896 a plank for the immediate municipal ownership of public utilities, which compelled both Mr. Harrison and Zina R. Carter, the Republican candidate, to emphasize their own adherence to municipal ownership of street railways as a principle and aim. A decision of the Supreme Court early in the year put an end to the separate municipal existence of the town of Pullman, and merged it in the city of Chicago.

Labor Troubles.—The last of the troops who had for months been on guard to preserve the peace between the union strikers and the non-union negroes at the coal mines in Pana, Ill., were removed March 25, the situation being regarded as sufficiently secure against a renewal of disorder to warrant it, and the grand jury adjourned without finding indictments against the miners and negroes who had participated in the riots which made the presence of the troops necessary. On April 11, however, another riot broke out between the black and the white miners, in which it was reported that five men and one woman were killed and eight persons wounded, and the trouble was settled only by the mine owners agreeing to recognize the union and send away the negro miners brought in from other localities. At Fredonia, Ill., a party of negroes was attacked by strikers, and in retaliation the negroes burned Union City, a town inhabited by union miners, who were driven to the woods, where the fight continued until reinforcements were sent to the aid of the union men. Early in July the strike at the stock-yards and packing-houses in Chicago was checked temporarily by increasing the wages of 5000 men. About the same time the importation of non-union negro miners to take the places of union white miners at Cartersville, Ill., made it necessary to call out the State militia, which remained in the town for ten weeks. As soon as they were withdrawn the negroes were again attacked, and seven of them were killed; the troops were therefore ordered to return. In view of the seriousness of the general situation, Governor Tanner expressed his determination to use every means in his power to bring the guilty to justice. It is estimated that during 1899 thirteen whites and fifteen negroes were killed, and about twice as many wounded, in these combined race and labor feuds.

Legislation.—The Allen law, passed by the legislature in 1897, which gave city councils the right to grant fifty-year franchises to street car lines, with five cents as the minimum fare, was repealed March 7, when Governor Tanner signed the Alling Street Railway bill, under which no franchises can be granted for a longer period than twenty years, and the city councils may stipulate for fares less than five cents. This change in the law was brought about by the remarkable uprising of popular indignation caused by the attempt of the Chicago city council to extend for fifty years the franchises controlled by the street car combination. The legislature created a board of inspectors, with power to inspect and license commission merchants, con-

sisting of one member from each of the following organizations: The Horticultural Society, the Dairyman's Association, the Retail Dealers' Association, the Butter and Egg Board, and the League of Commission Merchants. The office of State entomologist was created, with power to inspect orchards and nurseries; without his certificate of freedom from dangerous insects or contagious plant disease, no stock can be sold, and infected orchards and nurseries, pronounced by him incurable, may be destroyed without compensation to the owner. Parties must abide by the decision of the State Board of Arbitration under penalty of fine. A "Juvenile Court" was established, distinct from all other courts, in counties of over 500,000 inhabitants, for the trial, care, and disposition of all dependent, neglected, and delinquent children; and "Parental or Truant Schools" were established in cities, in which children guilty of habitual truancy or of habitual violation of public school rules are to be confined and taught. The Board of Pardons was granted greater powers, including the right to parole criminals confined in the State Penitentiary. A statute worthy of imitation was the prohibition of the public exhibition for pecuniary gain of persons who have been conspicuous through some criminal act, which has a tendency to degrade morals, of their pictures or of articles belonging to them, as well as the exhibition of persons whose deformity would attract public curiosity. The use of the national flag for advertising purposes, or its desecration, was prohibited. The office of State food commissioner was created, with power to inspect all food and see to the punishment of those who adulterate the same. The State Board of Health was authorized to examine and license all physicians and surgeons, and to supervise all lodging houses, the amount of air space therein to each person in every sleeping room being fixed by law.

The efforts to avoid future repetitions of the year's labor troubles resulted in the following legislation: Deception, misrepresentation, false advertising, false pretences, and unlawful force in the procuring of employees to work were prohibited, and failure to state the existence of a strike, lockout, or other labor trouble will hereafter be deemed false advertisement and misrepresentation, punishable by fine and imprisonment. It was declared a felony, with imprisonment in the penitentiary for from one to five years, to hire persons to guard with arms or deadly weapons other persons or property, and any person coming into the State with deadly weapons to guard other persons or property, without a written permit from the Governor, will be similarly punished. Free employment offices were established, one in each city of over 50,000 inhabitants, and three in cities of over 1,000,000, the offices and officials to be sustained and all expenses paid by the State. A State mining board of five members was created, to have supervision of mines, in addition to which the governor is to appoint seven inspectors of mines, having important powers and to be paid by the State. No inspectors of mines, mine managers, hoisting engineers, or mine examiners can be employed until they have been declared qualified by the State board. The character of construction and the machinery of all mines were regulated by very minute legislation, and many kinds of safety appliances were specifically required.

State Officers and National Representatives.—Governor, John R. Tanner; lieutenant-governor, W. A. Northcott; secretary of state, James A. Rose; treasurer, F. K. Whittemore; auditor, J. S. McCullough; attorney-general, E. C. Akin; adjutant-general, J. N. Reece; superintendent of insurance, J. R. B. Van Cleave; superintendent of education, Alfred Bayliss. Supreme Court: Chief justice, Joseph N. Carter; associate justices, J. W. Wilkin, J. H. Cartright, A. M. Craig, Jesse J. Phillips, B. D. Magruder, C. C. Boggs; clerks, A. D. Cadwallader, C. Mamer and Jacob O. Chance. The State legislature consists of 87 Democrats, 115 Republicans, 1 Populist, and 1 Prohibitionist. Senators: Shelby M. Cullom, from Springfield, and William E. Mason, from Chicago—both Republicans. Representatives: James R. Mann (Rep.), from Chicago; William Lorimer (Rep.), from Chicago; George P. Foster (Dem.), from Chicago; Thomas Cusick (Dem.), from Chicago; Edward T. Noonan (Dem.), from Chicago; Henry S. Boutell (Rep.), from Chicago; George E. Foss (Rep.), from Chicago; Albert J. Hopkins (Rep.), from Aurora; Robert R. Hitt (Rep.), from Mount Morris; George W. Prince (Rep.), from Galesburg; Walter Reeves (Rep.), from Streator; Joseph G. Cannon (Rep.), from Danville; Vespasian Warner (Rep.), from Clinton; Joseph V. Graff (Rep.), from Pekin; Benjamin F. Marsh (Rep.), from Warsaw; W. E. Williams (Dem.), from Pittsfield; Benjamin F. Caldwell (Dem.), from Chatham; Thomas M. Jett (Dem.), from Hillsboro; Joseph B. Crowley (Dem.), from Robinson; James R. Williams (Dem.), from Carmi; W. A. Rodenberg (Rep.), from East St. Louis; George W. Smith (Rep.), from Murphysboro.

ILLINOIS, UNIVERSITY OF, between Urbana and Champaign, Ill., opened in 1868, non-sectarian, co-educational, has the following schools, to each of which is added the number of students for the academic year 1898-99: The Graduate School (49 men, 9 women; total, 58); the colleges (629 men, 238 women; total, 867); the Biological Station (11 men, 4 women; total, 15); the Winter School in Agriculture

(26 men); the Law School (69 men, 2 women); the School of Medicine (479 men, 35 women; total, 514); the School of Pharmacy (151 men, 7 women); and the Preparatory School (132 men, 47 women); total in the University, 1492 men and 332 women, in all 1824. President, Andrew Sloan Draper, LL.D.

IMMIGRATION. No important bills have been passed or amendments to laws made regarding immigration in this country since the submission of the report of 1897-98 of the commissioner of immigration. In the report for the fiscal year ending June 30, 1899, mention was made, however, of important immigration regulations affecting the Hawaiian Islands, and also Cuba, Puerto Rico, and the Philippines. By the terms of the joint resolution of Congress, approved July 7, 1898, whereby the Hawaiian Islands were annexed to the United States, it was provided that all laws in the islands then in force should so continue, except that the federal statutes in relation to the exclusion of Chinese should be extended thereto. In the following session of Congress a bill was introduced to extend the anti-contract law of the United States to Hawaii, but it failed to become a law. The result, reports the commissioner of immigration, through unofficial information, is the introduction into the new territory since the passage of the resolution of annexation, of not less than 25,000 Japanese coolies under contract to work on the sugar plantations, besides an unknown number of Portuguese and Italians. He also reports the news of the arrangement for wholesale importation of Italian peasants into Hawaii. In striking contrast to the conditions prevailing in Hawaii, the islands now held under the rules of military occupation have been subjected to the immigration laws and regulations by action of the secretary of war. These islands are not, however, under the jurisdiction of the Bureau of Immigration. This bureau recommends, among amendments to the general immigration laws for the year, some action to prevent the frequent evasion of the laws effected at our larger ports by aliens who enter this country under the guise of sailors, and who thus gain entrance without their fitness to land being determined. There is recommended, also, careful legislation affecting immigration from Canada and Mexico. Amendment is also recommended for that section of the act of March 3, 1893, which prescribes the compilation by oceanic transportation lines of a list of the aliens in cabin passage, whether first or second class. Owing to the lateness of cabin passengers to arrive on board ship, and the consequent impossibility of making up the list in time to be sworn to before a United States consul at the port of embarkation, the agents of the various steamship lines have been unable, though reported willing, to comply with the law. This state of affairs, according to the commissioner-general of immigration, not only lessens the chance of detecting infringements of the law by cabin passengers, but has, besides, he says, induced the most objectionable class of aliens to secure cabin transportation as a means of escaping the vigilance of the inspection officers. This vigilance can be effectively exercised as to steerage passengers by reason of the lists or manifests containing complete information regarding each person. Of the arrivals of cabin passengers in this country during the period to which the report of the commissioner for the fiscal year ending June 30, 1899, relates, there were 25,000 who intended to remain here and who would have been classed as immigrants had they travelled in the steerage.

Reference is also made, in the current immigration report, to the increasing number of Japanese, of the class known as "coolies," coming in at the Pacific ports. There is evidence of an elaborate and ingenious system by means of which this class are brought over under contract made through agents in the principal cities on the Pacific coast, to work under contractors for various kinds of construction in which cheap and unskilled labor can be utilized. Present indications point to a steadily increasing immigration of this character.

Immigration to the United States, which had been decreasing since 1896, showed an increase of 82,416 for the fiscal year 1899. The figures for the years ending June 30, for 1896, 1897, 1898, and 1899 are respectively 343,267, 230,832, 229,299, and 311,715, the increase in immigration of 1899 over 1898 being 36 per cent. Europe supplied 297,349 of the total 311,715; Asia, 8972; Africa, 51; all other lands, 5343. The increases were: From Europe, 79,563; Asia, 335; Africa, 3; other countries, 2515. The total of 311,715 does not include immigrants from Canada and Mexico. Italy shows an increase of 32 per cent. for 1899, and Austria-Hungary, 57 per cent., while the Russian Empire, with Finland, shows an increase of 104 per cent. Italy sent to this country nearly 80,000 immigrants, and Hungary and Russia over 60,000 each. Great Britain sent 45,123. Out of the total number of immigrants there were 195,277 males and 116,438 females. The number under 14 years of age were 43,983; over 45 years, 19,545, and between 14 and 45 years of age, 248,187. Of the number over 14 years of age who were illiterate, 1022 persons could not write, and 60,446 could neither read nor write. As many as 174,613 immigrants landed in this country with less than \$30 each. The number debarred from landing were returned for the following causes: Convicts, 8; insanity, 20; assisted in immigration, 82; diseased, 348; under contract labor, 741; paupers, 2599. About 800 paupers and 300 contract

laborers were debarred on the borders of the United States. The expense incurred for the enforcement of the immigration laws for the fiscal year ending June 30, 1899, was \$288,022.26, and the receipts aggregated \$421,457.64. The balance on hand, \$418,326.43, is a gain over that of the foregoing year of \$133,445.38. An appropriation of \$100,000 was made for the enforcement of labor alien laws, of which \$87,725.08 was expended.

IMMUNITY. See SERUM THERAPY; TYPHOID FEVER.

IMPERIAL ACADEMY OF SCIENCES OF ST. PETERSBURG, founded by Peter the Great in 1725, comprises three divisions: (1) The physical and mathematical; (2) the Russian language and literature; and (3) the historical and philological. There are also three classes of academicians. The academy has a library of 180,000 volumes and 13,000 manuscripts, and receives 300,000 roubles from the government annually.

IMPORTS AND EXPORTS. See UNITED STATES and the articles on foreign countries.

INDEPENDENT ORDER OF GOOD TEMPLARS. See GOOD TEMPLARS, INDEPENDENT ORDER OF.

INDEPENDENT ORDER OF ODD FELLOWS. See ODD FELLOWS, INDEPENDENT ORDER OF.

INDIA, BRITISH, a dependency of Great Britain, including those parts of Hither and Farther India which are under British administration. India has an area of 1,068,314 square miles, or with the feudatory states, 1,800,253. Its total population, according to the revised census statistics for 1891, is 287,223,431 inhabitants, of which about 66,000,000 are included in the feudatory states.

Government.—The secretary of state for India, a member of the British cabinet, has control of Indian affairs, and is assisted by a council of fifteen members. The executive authority is vested in a viceroy or governor-general, who becomes resident in India. The latter is appointed by the crown, and acts under the authority of the secretary of state for India. He also has a council, consisting of five members appointed by the crown, and of the commander-in-chief as an extraordinary member, each in charge of an executive department. There is a legislative council, consisting of the members of the executive, together with from ten to sixteen members nominated by the viceroy. British India was formerly divided into the three presidencies of Bengal, Madras, and Bombay, but with the extension and gradual reorganization of the dependency the expression "presidency" has lost its meaning. British India is at the present time really divided into thirteen local governments or administrations, as follows: Madras and Bombay (still termed presidencies), under governors; Bengal, northwest provinces, with Oudh, the Punjab, and Burmah, under lieutenant-governors; Assam, central provinces, Berar, Ajmere Merwara, Coorg, British Baluchistan, and the Andaman Islands, under chief commissioners. These several local governments are allowed a large measure of financial and administrative independence. The governors of Madras and Bombay are appointed by the crown, and are assisted by legislative and executive councils like those of the governor-general. The present (1899) governor-general or viceroy is the Lord Curzon, of Kedleston (formerly the Right Hon. George N. Curzon), who was appointed in 1898 and in the same year raised to the peerage under his present title.

Army.—The defence of India is provided for by an army consisting in 1897-98 of a European corps of 74,288 (74,466 on January 1, 1899), including 3616 European officers, and of a native corps of 140,640 (148,000 in 1899), including 1578 European and 3209 native officers, or a total of 214,928. According to the estimates of 1898-99, the total strength of the Indian army was about 219,370. The service is divided into the four commands of Bengal, Madras, Bombay, and the Punjab. Besides these troops, there are some 30,000 volunteers for active service in cases of emergency, and a trained reserve of natives, the imperial service troops, numbering in 1899 at least 19,000. Under the administration of Lord Curzon an important change of frontier policy has been introduced. To save great expense and the loss from the regular army of large numbers of men stationed at the distant frontier positions, it has been proposed to enlist the tribes in the defence of their own country, thus allowing a partial withdrawal of regular troops from the advanced fortified positions of the country. The provision of adequate military security for these positions will be supplied by the maintenance of camps or movable columns at neighboring points within or upon the administrative border of India. These cantonments will, where possible, be connected by light railways with the military bases of British India, so that it will be possible to push forward, almost at a moment's notice, the forces required for the suppression of disturbances or the support of the militia. Large bodies of troops were sent from India to South Africa in September and October, 1899. The

smoothness and facility of their transportation was a subject of favorable comment among military observers.

Justice and Crime.—There are high courts of justice in Madras, Bombay, Bengal, and the northwest provinces (from which appeal can be had to the privy council). The Punjab has a chief court with five judges, and the central provinces, Oudh, and Lind have each a judicial commissioner. Burmah also has a judicial commissioner as well as a recorder. In Assam the highest judicial authority is the high court at Calcutta. In 1896 the police numbered 142,600. The number of prisoners in jail at the end of 1896 was 109,934. During 1896, 840 persons were convicted in criminal cases.

Currency.—The monetary unit of India is the rupee, the value of which in United States currency, October 1, 1899, was 20.7 cents. The closing of the mints to silver in 1893 was due to the steady losses suffered by the Indian government from the depreciation of that metal. The government had incurred a large debt in European markets, and this had to be paid in gold, but the government revenues were paid in silver, and with the falling off in the value of that metal the financial burden constantly increased. Taxation was proposed, but considered inexpedient as likely to foster popular disturbances. The land taxes upon which the government relied were determined for long periods of time and could not be increased. When the closing of the mint to silver was decided upon in 1893 provision was made that when the rupee rose to the value of 1s. 4d. the mints should be reopened to the coinage of silver. The value of the rupee gradually rose, and so far as the government was concerned the financial conditions greatly improved. But complaint was made that the native growers and European planters were suffering severely from the change. It was argued that these classes were obliged to pay labor on the old scale, in spite of the appreciation of the currency. Hence, while industrial expenses remained nominally the same, the employers received lower profits. Heavy losses fell also upon the natives, who as times grew hard were obliged to turn their hoards of silver into money. The official classes were heartily in favor of the continuance of the new system, and showed their hostility to anything like a retrograde movement by the reply which they returned in 1898 to the proposals of the United States monetary commission of 1897. Finally in the spring of 1898 a currency committee under the chairmanship of Sir Henry Fowler was appointed to investigate the monetary situation in India. This committee reported in July, 1899, in favor of maintaining the gold standard and making it more effective. They declared that the British sovereign should be legal tender and that there should be free coinage of gold as in the branch mints of Australia. The government was advised to exchange gold for rupees at the rate of 1s. 4d. It was argued that this was absolutely necessary as a measure of stability and that any other course would be dangerous to India, four-fifths of whose trade is with gold countries. The project for the borrowing of gold to constitute a reserve was not favored, and it was pointed out that a considerable amount of gold had already been accumulated and that after the definite adoption of the gold standard a further accumulation would be facilitated. Trade was to be relied upon, and not the expedient of borrowing, which was considered wasteful. The committee opposed the policy of binding the government to redeem current rupees in gold. As to the course which India might take in the improbable event of an international agreement in regard to silver, the committee pointed out that none of its proposals would prevent India from taking part in such an agreement. The report of the committee became the basis of a law which was enacted in September, 1889.

Revenue, Expenditure, etc.—In 1897-98 (revised estimate) the revenue was Rx96,561,500 and the expenditure was Rx101,844,600. The large deficit of that year was due to widespread famine and to military operations on the northwestern frontier. In 1898-99 (budget estimate) the revenue was Rx99,085,400, and the expenditure, Rx98,194,000. The financial statement of March 20, 1899, estimated the surplus for 1899-1900 at Rx3,930,000. The largest branch of expenditure in ordinary years is for the army, which cost Rx27,073,100 in 1897-98. The army estimate for 1898-99 was Rx25,055,900. In regard to revenue the most important items are land, contributing (budget estimate) Rx27,568,200 in 1898-99; opium-contributing Rx5,329,800, and salt, contributing Rx8,728,000. There are also incomes from stamps, excise, customs, provincial rates, railways, irrigation, assessed taxes, and forests. Also the post, telegraph, and mint.

Railways.—The total length of railways open for use or under construction on March 31, 1899, was 26,059 miles, being a net increase of 604 miles during the previous twelve months. Of this mileage 3568 miles were still under construction or sanctioned. The total capital outlay on railways open on December 31, 1898, was \$857,690,000, an increase of \$27,000,000 over 1897; the gross earnings were \$87,885,501, or a gain of \$5,981,012. The number of passengers carried was 152,584,320, an increase of 1,320,505. The rolling stock was 4335 locomotives, 12,814 passenger

coaches, and 80,708 freight cars. The roads are divided into those which are owned and worked by the state, those which are owned by the state and worked by companies, lines worked by native guarantee companies, lines worked by assisted companies, and lines owned by native states. On March 31, 1898, out of a working mileage at that time amounting to 21,157, 10,422 miles were state lines worked by companies.

Agriculture.—Nearly 200,000,000 are dependent upon agriculture in India, and since 1870 the government has made special efforts to introduce improved methods and increase the production. The chief crops are rice, wheat, and other food grains, oil seeds, cotton, sugar-cane, tobacco, tea, jute, and indigo. Rice is the staple product and principal article of food. In 1896-97 the total acreage of rice was 66,234,485; wheat, 16,183,987; other food grains, 78,237,544; sugar cane, 2,651,721; cotton, 9,458,842; oil seeds, 10,531,864; jute, 2,215,105. Over 77,000 square miles of forests had been reserved in 1899, a state policy which is being vigorously pushed.

Manufacture.—After agriculture in importance comes manufacturing, especially in cotton, silk, and jute goods, and various articles of luxury, fine textile products and highly wrought work in ivory and precious metals. In 1896-97 there were 154 cotton mills in operation in India, and there were 145 collieries. See COTTON AND THE COTTON INDUSTRY.

Commerce.—The year 1898-99 was a prosperous one for Indian trade, as compared with the previous two years, when commerce was affected by the famine, the bubonic plague, and monetary conditions. In 1898-99 the exports of foreign trade were Rx120,213,000, of which Rx112,801,000 represented merchandise and the remainder gold and silver. The principal items were rice, raw and manufactured cotton, raw and manufactured jute, opium, seeds, hides and skins, tea, wheat, and indigo. The principal countries taking India's goods are, in the order of importance, the United Kingdom, China (Hong Kong and treaty ports), Germany, France, Straits Settlements, Egypt, the United States, Japan, Ceylon, Belgium, and Italy. In regard to imports for 1898-99, India received cotton manufactures, metals and metallic goods, sugar, oils, machinery, railway plant and rolling stock, silk, woollen goods, apparel, etc., to the value of Rx72,111,000. Counting gold and silver treasure, the total imports were Rx90,007,000. In addition to the foreign maritime trade India has a flourishing frontier land trade, the imports of which were in 1898-99 valued at Rx6,092,943, and the exports at Rx5,289,725, according to the incomplete returns available. The countries contributing to the foreign imports were the United Kingdom, Belgium, Germany, China, Russia in Asia, Straits Settlements, Mauritius, Austria-Hungary, and the United States. About 4000 vessels engaged in the foreign trade, with a tonnage of nearly 4,000,000. United States trade is gradually increasing. With Russia, this country furnishes most of the kerosene oil to India, a product which at the present time makes up the bulk of her imports into India, while she takes from that country chiefly hides and jute. American imports of raw jute are large, and of gunny-bags this country takes a very large proportion of the whole produce of India, and over two-thirds of the output of jute cloth. This is in spite of the high Dingley tariff on jute. Of gunny-bags the United States and the United Kingdom each took over \$40,000,000 in 1898-99, and of the cloth the United States took over 180,000,000 yards, against 35,000,000 by South America and 20,000,000 by Great Britain and Ireland. It is said that the principal clothing of over 250,000,000 of the inhabitants of India is of cotton, which means a considerable importation of the manufactured article, and much of this is of American origin. The export of the native article, both raw and manufactured, has in recent years been reduced by the increased purchases in Europe of American cotton, due to the cheapness and abundance of the latter. Within the past two or three years, notably 1899, the import of sugar into India has greatly increased. It has been said that the closing of the American market by the Dingley tariff has diverted the refined sugar exports of Germany, Austria, and France eastward, and quantities are being sent to India.

Language, Religion, and Education.—The languages spoken in India, excluding the European and other tongues in use among comparatively small groups, are 78 in number, contained in a dozen different families; 20 languages belonging to five families are, it has been estimated, spoken by not less than one million persons each. The Hindoo is the most important, being spoken by 85 per cent. of the population. In all, according to the census of 1891, 118 linguistic groups are recognized. The English language was spoken by 238,499, a large number, since those of British origin number only about 100,000. The Hindoo religion, like the Hindoo language, prevails in India, being adopted by about three-fourths of the population. The Mohammedans numbered 57,321,164 in 1891; the so-called Animists, 9,280,467; and the Buddhists, 7,131,361, of whom the great majority were in Burmah. The number of Christians was estimated at 2,125,000. There are five universities in the educational system of India, the universities of Calcutta, Madras, Bombay, the Punjab, and Allahabad. There are examining bodies. On March 31, 1897, there were 152,025

schools and colleges, with an attendance of 4,356,870, of which number only about 400,000 were girls.

History.—Lord Curzon, the new viceroy, landed in Bombay, December 30, 1898, and received an enthusiastic welcome. The policy of the administration was outlined in August. It involved in the first place some measures of military retrenchment. The large and costly fortifications which had been planned in the Chitral Valley and Khaibar were abandoned, and the railway through Khaibar was also given up. For the protection of the Khaibar it was proposed to strengthen and reorganize the Khaibar Rifle Corps. In general the policy was to do away with the existing system of shutting up the regular forces at points on the frontier. A native militia under British officers was to be stationed at certain points on the frontier, and these points were to be connected with movable camps on the border, which camps were in turn to be joined by light railways and connected with the military bases. Another object of the administration was to check the growth of bureaucratic power by granting a greater degree of independence to the collectors of the districts. Important legislative measures of the year were an act passed by the legislative council in February for the protection of persons against unfairly contracted bargains, and an act passed in March imposing countervailing duties on imported bounty-fed sugar. The latter aroused much opposition in England, where it was regarded as a violation of free-trade principles, but it was defended on the ground that it protected the sugar producers against their bounty-fed competitors in European countries. The British government had made many attempts to secure some concerted action on the part of European governments in this matter of sugar bounties. These had failed, and the present expedient marked a new line of policy. As to the foreign relations of India, the most noteworthy event was the threatened bombardment, February 16, of the Sultan of Oman's capital to make him withdraw the grant of a coaling station to France. (See FRANCE, paragraphs on History.) The mortality from the plague was reported to be diminishing in April, but the number of deaths down to the beginning of the year was estimated at 250,000, 134,000 occurring in Bombay, and this estimate was probably too low. Toward the close of the year the plague became more virulent, especially in Bombay, where the daily death rate was estimated at 200. (See PLAGUE.) The Famine Commission appointed to investigate the causes of the famine of 1897 reported that the land-owning and land-cultivating classes, the skilled artisans, and the commercial classes showed an improved condition, and did not appear to be in serious danger from famine, but among the poorer professional classes and the lower classes whose subsistence was precarious, there was still danger of distress. Toward the close of the year the famine was spreading widely, and covered the greater part of the central provinces and the southeast Punjab. The viceroy made a personal tour of the famine-stricken districts late in the autumn.

INDIANA, an east central State of the United States, has an area of 36,350 square miles. The capital is Indianapolis. Indiana was admitted to the Union December 11, 1816.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 141,852,594 bushels, value, \$38,300,200; wheat, 25,361,175, \$16,231,152; oats, 34,301,248, \$7,889,287; barley, 153,300, \$68,985; rye, 464,633, \$223,024; buckwheat, 85,296, \$50,325; potatoes, 8,214,232, \$3,532,120; and hay, 2,093,376, \$16,328,333. Live stock, January 1, 1900, comprised horses, 577,220, \$29,337,792; mules, 38,734, \$2,141,258; milch cows, 605,855, \$20,447,606; other cattle, 629,075, \$20,536,787; and sheep, 677,905, \$2,713,993.

Industries.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$17,213,070, an increase in a year of \$7,190,796. There were 98 manufacturers of tobacco and 869 of cigars, and the total output was 73,675,969 cigars, 130,424 pounds of plug, 139,031 pounds of smoking, and 540 pounds of snuff. Grain and fruit distilleries in operation numbered 27; the production of fruit brandy was 2003 gallons; amount of spirits rectified, 1,192,662 gallons; distilled spirits gauged, 28,526,150 gallons; production of fermented liquors, 766,896 barrels; and production of oleomargarine, 5,435,330 pounds. The annual report of the State geologist, issued in 1899, caused much alarm throughout the State, as it declared that the centre of the natural gas field had been reduced to less than 150 square miles. This opinion was sustained by the State gas inspector, so far as the near exhaustion of the field is concerned. The last officer reported that the great natural gas reservoir of the State, which at one time contained 2800 square miles, has narrowed to little more than 200 square miles of first-class territory, while the entire gas-producing territory can be included in 500 square miles, almost entirely in Grant, Delaware, and Madison Counties. On these reports natural gas supply companies began cutting off all consumption, excepting in residences, in November, and notified consumers to stock up with coal and wood.

In the northwestern part of Delaware County is a region covering nearly an entire township that is rich in both gas and oil. A number of corporations are using all the

gas they can obtain in order to exhaust the supply and get at the greater quantity of oil more quickly. This proceeding is upheld by State laws, which prohibit the mining of oil wherever gas may escape. Further development of the newly discovered beds of asphaltum lying beneath the eastern part of the city of Logansport shows that the area is much larger and the quality much better than the experts first supposed. The beds extend four miles from the city limit, and the asphaltum can be seen oozing out from between the rocks on the banks of the Wabash. At one point, and at a depth of 64 feet the bed was found to be four feet thick. During the calendar year 1898 the output of 141 coal mines was 4,920,743 short tons, valued at \$3,994,918, an increase of 769,574 tons over that of 1897, which was the largest in the history of the State. The principal quarry product was limestone, valued at \$1,686,572.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the delivery ports of Evansville and Indianapolis aggregated in value \$327,761, an increase in a year of \$22,469; exports, none.

Railways.—The new railway construction during 1898 was 32.50 miles, and in 1899, 61.23, giving the State a total mileage of 6502.15.

Banks.—On October 31, 1899, there were 113 national banks in operation, and 77 in liquidation. The active capital aggregated \$14,192,000; circulation, \$5,893,740; deposits, \$57,027,123; and reserve, \$23,128,962. The State banks, July 27, 1899, numbered 97, and had capital, \$4,514,190; deposits, \$15,100,945; and resources, \$20,859,520; loan and trust companies, 5, with capital, \$2,010,900; deposits, \$2,942,415; and resources, \$5,236,153; private banks, 52, with capital, \$1,146,615; deposits, \$5,188,894; and resources, \$6,692,153; and mutual savings banks, 5, with depositors, 20,191; deposits, \$5,323,607; and resources, \$5,907,372. The exchanges at the United States clearing-house at Indianapolis in the year ending September 30, 1899, aggregated \$147,373,443, an increase of \$13,525,330 in a year.

Education.—At the close of the school year 1897-98 the school population was 754,905; enrolment in public schools, 566,157; average daily attendance, 432,931. There were 15,223 teachers, 9754 buildings used as school-houses, and public school property valued at \$21,536,212. The revenue was \$7,441,546; expenditure, \$7,846,139, of which \$4,762,347 was for teachers' salaries. There were 349 public high schools, with 983 secondary teachers, 22,812 secondary students, and 5970 elementary pupils; 29 private secondary schools, with 165 teachers, 2048 secondary students, and 2760 elementary pupils; 3 public normal schools, with 40 teachers and 1463 students, and 11 private ones, with 181 teachers and 6597 students. Normal training was also given in 6 colleges and 7 public high schools. Fourteen colleges and universities for men and for both sexes reported 1 fellowship, 298 professors and instructors, 4344 students, 200,905 volumes in the libraries, valued at \$293,300; \$185,750 invested in scientific apparatus, \$3,710,000 in grounds and buildings, and \$2,041,283 in productive funds; \$491,073 in total income; and \$171,550 in benefactions. In 1899 there were 851 periodicals, of which 147 were dailies, 588 weeklies, and 81 monthlies.

Finances.—The total assessed valuation of property in 1899 was \$1,343,099,379, the highest on record, and an increase in a year of \$57,134,323. The State tax rate for the general fund was \$0.90 per \$1000, and for all State purposes, \$2.96. The debt was, foreign, all subject to call, \$4,916,615; domestic, all held by Purdue and Indiana Universities, \$484,000—total, \$5,400,615, carrying annual interest of \$176,925. The foreign debt was reduced by \$593,385 in 1898.

Population.—As estimated by federal officials the population on June 30, 1899, was about 2,635,000.

Legislation, etc.—Two constitutional amendments will be voted on at the general election in 1900: (1) To change the number of Supreme Court judges from "not less than three nor more than five" to "not less than five nor more than eleven judges," and (2) to change the provision that "every person of good moral character, being a voter," shall be entitled to admission to practise law in all courts of justice, to "the General Assembly shall by law prescribe what qualifications shall be necessary for admission to practise law in all courts of justice." The present "wide-open door" policy has been found prolific of mischief to a confiding public. The Board of Health was charged with the duty of inspection and the enforcement of the law prohibiting, under heavy penalties, the adulteration of food, drugs, liquors, and confectionery, and requiring the destruction of the adulterated articles. The importation of indigent children was forbidden, under heavy penalties, except as permitted by the State Board of Charities, which is granted great power. Voting machines were authorized, with penalty of fine and imprisonment of those who tamper with or deface them; and a voter selling or offering to sell his vote at any general, special, or primary election or convention, for any consideration whatever, shall be disfranchised for not less than ten or more than twenty years.

The new laws punish lynching with great severity. A "mob" was declared to be any collection of individuals assembled for any unlawful purpose, intending to

injure any person by violence and without authority of law, and the act of violence committed was declared to be "lynching." When such violence results in death those participating or aiding and abetting shall suffer death or imprisonment for life, and those present but not participating shall be imprisoned for not less than two nor more than twenty-one years. The law also provides for impeachment of officers from whose custody prisoners are taken by mobs, and bystanders who, being called upon, refuse to assist the officer in defending the prisoner are subject to fine and imprisonment.

A labor commission, consisting of two members, was organized; one member must have been for not less than ten years an employee for wages and must be affiliated with the labor interest, the other must have been for not less than ten years an employer of labor; they must not be under forty years of age, must not belong to the same political party, and neither must hold any other office. Whenever this commission hears of any labor complication, the members shall at once put themselves in communication with the parties to the controversy, with a view to induce them to arbitrate, the arbitration board to consist of the two commissioners, the circuit judge, and one to be selected by each of the contending parties; the courts are charged with the duty of enforcing the award. A department of inspection was created to carry out the provisions of a drastic and far-reaching law that provides with much detail for the safety and health of those who labor in factories and mercantile houses; the chief inspector is given most unusual powers, and the penalties for the violation of the statute are severe, inflicting both fine and imprisonment.

An act was passed providing that no ordinance for the purchase or establishment of any water-works or lighting plant or the granting of any franchise for the establishment or operation of any water-works or lighting plant, street railroad, telephone, or telegraph company in any incorporated town shall go into effect until thirty days after its passage and until voted upon at the polls, if within thirty days a referendum is demanded by 40 per cent. of the legal voters of such incorporated town. Trade combinations were prohibited, with a fine and imprisonment provided for each person taking part in the making of such combination. The miners' strike at Evansville, Ind., assumed a serious aspect June 21, when thirty negro miners were attacked by armed strikers lying in ambush. Five of the negroes, who had been imported by the Sunny Side mine from Kentucky, and one white man having them in charge, were shot, with the result that the mine was closed and the imported men were kept in hiding.

State Officers and National Representatives.—Governor, James A. Mount; lieutenant-governor, W. S. Haggard; secretary of state, U. B. Hunt; treasurer, L. Levy; auditor, W. H. Hart; adjutant-general, J. K. Gore; attorney-general, W. L. Taylor; superintendent of instruction, F. L. Jones; commissioner of insurance, C. W. Neal; commissioner of public lands, L. G. Rothschild; chief of bureau of statistics, J. B. Conner; geologist, W. S. Blatchley. Supreme Court: chief justice, John V. Hadley; associate justices, James H. Jordan, A. Dowling, L. J. Monks, F. E. Baker; clerk, R. A. Brown. The State legislature consists of 89 Republicans and 61 Democrats. Senators, Charles W. Fairbanks, from Indianapolis, and Albert J. Beveridge, from Indianapolis—both Republicans. Representatives, James A. Hemenway (Rep.), from Boonville; Robert W. Miers (Dem.), from Bloomington; W. T. Zenor (Dem.), from Corydon; F. M. Griffith (Dem.), from Greensburg; George W. Faris (Rep.), from Terre Haute; James E. Watson (Rep.), from Rushville; Jesse Overstreet (Rep.), from Franklin; George W. Cromer (Rep.), from Muncie; Charles B. Landis (Rep.), from Delphi; E. D. Crumpacker (Rep.), from Valparaiso; George W. Steele (Rep.), from Marion; J. M. Robinson (Dem.), from Fort Wayne, and Abram L. Brick (Rep.), from South Bend.

INDIANA UNIVERSITY. See UNIVERSITIES AND COLLEGES; PSYCHOLOGY, EXPERIMENTAL.

INDIANS OF THE UNITED STATES. *Population and Languages.*—The territory within the present limits of the United States was originally occupied by hundreds of native tribes and confederacies, speaking a multiplicity of diverse languages and dialects, but all closely resembling each other in physical characteristics, the population being greatest along the coast and the large streams, and sparsest in the arid regions of the West. The total number within the territory in question may have reached 600,000, which has now been reduced by war, famine, and disease to about 240,000, the destruction having been greatest along the Atlantic coast, where whole tribes have been so completely wiped out that their very names are forgotten. The early slave trade had more to do with this result than is generally known, thousands of Indians having been deported to the West Indies and sold as slaves by Spaniards, French, and English almost up to the end of the last century. The decrease has also been great among the Western tribes, although a few seem to

have held their own, while one or two which have been least disturbed may have actually increased. Within the past seventy years most of the Eastern tribes have been removed to the Indian Territory, which was originally set aside for this purpose by the government, while others have emigrated to Canada and a few to Mexico. About 25,000 Indians still remain east of the Mississippi, among these being the Penobscots and Passamaquoddies in Maine, the Six Nations in New York, the Pamunkies and others in Virginia, the Cherokees and so-called Croatans in North Carolina, the Catawbas in South Carolina, the Seminoles in Florida, the Choctaws in Mississippi, the Miamis in Indiana, and the Ottawas, Chippewas, Winnebagos, Menominis, Pottawatomis, and Oneidas in Michigan and Wisconsin.

The hundreds of native languages and dialects formerly spoken within the limits of the United States are reducible to about fifty distinct linguistic stocks. Of these, the Algonquian—extending along the Atlantic coast from the St. Lawrence almost to Cape Fear and northwestward quite to the Rocky Mountains—stands first in historical importance and wealth of literature. Tribes of this lineage greeted the discoverers at Penobscot, Plymouth, and Manhattan Island, at Jamestown and Roanoke, and under such leaders as Philip and Tecumtha they afterward contested every step of the conqueror's advance for more than two centuries. Other important stocks were the Iroquoian and Muskogean in the East and the Siouan in the West. The Cherokees alone have their own alphabet, invented by Sequoyah, a member of the tribe, about the year 1820 and now in general use among the full-bloods. Each of the five civilized nations in the Indian Territory—the Cherokees, Creeks, Choctaws, Chickasaws, and Seminoles—publishes all official documents in the language of the tribe, while the Cherokees have also their own national newspaper, printed partly in the language. There is also a small journal published in the Sioux language. Besides the dialects of regular development, there were "trade jargons," among which may be noted the Mobilian trade language, a corrupted Choctaw, formerly in use among the Gulf tribes; the Chinook jargon of the Pacific coast, from California far up into Alaska, and the curious "sign language" of the plains.

Houses.—The style and construction of the dwelling was determined by the necessities of habit and surrounding. Broadly speaking, the sedentary Indians built substantial structures, while nomadic tribes were content with temporary shelters, each using always the material most convenient to hand. Along the Atlantic coast and in the Ohio Valley the prevailing type was that commonly known under its Algonquian name of *wigwam*, having the shape of an old-fashioned wagon top, and made of bark laid over a framework of poles. Around the inside were raised platforms, which served both as seats and beds. The smoke escaped through a hole in the roof, and the only light came from the open door or from the fire almost constantly burning in the centre of the floor. The Iroquois "long house" was a variant of this type, having partitioned rooms opening upon a central passageway, so as to accommodate a number of families. In the Gulf States the houses were commonly of logs, planted upright in the ground, either in square or circular arrangement, chinked with clay and sometimes thatched with grass. Each family had also its own provision house, built of bark and raised upon poles to protect it from prowling animals. In every principal settlement was a council house, or "townhouse," a large circular structure of logs, with high conical roof thatched with grass and frequently further protected by a covering of earth. Inside were platform seats, sometimes ranged in tiers one above another to accommodate a greater number of spectators. In this were held the public functions, such as councils and dances. Among the Creeks the larger towns had each a public square with special buildings along the sides for the representatives of each clan, and a clear space in the centre for games and other ceremonials. Some tribes of the gulf region had immense dead-houses, or mortuaries. The houses of the settlement were usually widely scattered, but a few towns were compactly built and enclosed in strong palisade defences.

The Ojibwa, or Chippewas, of the lakes lived in conical bark lodges, while the Winnebagos and Sauks of the upper Mississippi covered their wigwams with mats woven from rushes. The houses in the permanent villages of the Mandans, Arikara, and Pawnees along the Missouri were solidly built of logs covered with earth, while along the whole extent of the plains the only shelter of the roving buffalo-hunting tribes was the conical *tipi* of buffalo skins laid over poles brought together at the top. In winter this was protected from the keen prairie blast by a circular wind-break of woven brushwood. The Wichitas on upper Red River built houses of long grass laid over a framework of poles. On the Columbia the houses were usually rectangular in shape, built of boards split from the cedar and elaborately painted with symbolic designs. The winter hut was partly sunk below the surface of the ground. With some tribes the house was a communal structure of two hundred feet or more in length, sheltering a whole band under the same roof. California had several very distinct types, among which the principal were the round-topped, clay-covered huts of the Sacramento, and in the warm South the



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INDIANS.—1. Navajo Weaver. 2. Choctaw Reed House, Sou



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ern Louisiana. 3. A Young Kiowa. 4. Hopi Bread Makers.

rush-mat lodges with arbors running along the front. The Papagos, south of the Gila, had a circular hut of grass thatch and a more substantial house of rectangular form, of clay plastered over laths or cross-pieces of cactus wood. The *wiksup* of the Piutes and Apaches was hardly more than a brushwood shelter, but the Navaho *hogan* was a permanent structure of logs filled in with earth, while the stone or adobe house of the Pueblo tribes, with its thick walls and well-squared corners, was built to endure for centuries. So far as known, Indian invention had never devised a chimney, unless perhaps among the Pueblos.

Food.—The majority of the tribes depended for subsistence chiefly upon agriculture, while hunting was rather a secondary occupation, excepting upon the buffalo plains. Corn, beans, and squashes were the staples of cultivation, and in the arid regions of the southwest the fields were rendered fruitful by a laborious system of irrigation. The woman was always the miller as well as the cook, the corn being beaten in wooden mortars or ground upon stone metates. In the lake region, where the season was too short for Indian agriculture, the wild rice supplied the place of corn. Several tribes, notably on the upper Missouri and among the Pueblos, cultivated a native tobacco, but the ordinary "tobacco" in use was a mixture of various barks and leaves. Sunflowers were sometimes cultivated for their seeds, which were beaten into an oily paste. Peaches, introduced by the whites, were adopted by the agricultural tribes at a very early period. Nuts, persimmons, wild plums, cranberries, and other wild fruits were gathered and used in large quantities. A delicious oil was obtained by beating up hickory nuts and treating the paste with water. The Columbia River tribes subsisted largely upon salmon, with camas and other marsh roots, while those of the coast range and the Sierras may be said to have depended entirely upon acorns and piñons. In the Sacramento Valley whole communities went out into the meadows in the summer season to feast upon the red clover blossoms. Fish, oysters, and clams were much used along the coast, the lakes, and in the well-watered timber region. Game, according to the nature of the country, was hunted by all of the tribes, particularly upon the plains, where the buffalo was almost the sole dependence. The art of making sugar from the sap of the maple is an Indian discovery, and among the Northern tribes the sugar-making season in early spring was always a time of busy industry. Distilling was probably unknown north of Mexico, but mild ferments were prepared from corn and the maguay by some tribes of the southwest, and a species of cactus was chewed for its exhilarating effect among those of the southern plains. Certain peculiar drinks were also used on ceremonial occasions. Ceremonial cannibalism was widely prevalent, but genuine cannibalism as a means of food supply was probably unknown within the United States.

Arts and Industries.—The native arts were well adapted to the simple necessities of the tribes, and the primitive product was often beautiful in design and execution, but degenerated rapidly after the coming of the whites in consequence of the ease with which manufactured goods could be obtained from the traders. The principal materials employed were wood, shell, bone, and teeth, stone, skins, mica, and copper. Stone was used for hammers and hatchets, knives, scrapers, lance blades, and arrow heads, pipes and gaming wheels, pots and metates. Some of the finest art of the Indian was expended upon his pipes. Arrow points and knife blades were shaped by flaking from flint or obsidian. Some of the most beautiful art specimens were the circular stone gaming disks of the southern tribes. Shells were fashioned into gorgets, or cut or bored to make the celebrated wampum beads which supplied their chief decoration. Bone and teeth were used for tipping arrows, for knife blades, and sewing awls, while spoons were fashioned from horn. Wood and bark were used in the heavier constructions, such as houses, scaffolds, and canoes. The dug-out canoe was shaped by alternate burning and chipping, and those of the tribes about Puget Sound, carved from a single cedar trunk, were sometimes nearly one hundred feet in length. The Pueblos were noted for their wooden figurines. Mica was quarried for breastplates and mirrors, for which there was an extensive intertribal demand.

Skins were dressed for clothing, tipi covers, saddles, and other articles, most of this work being done by the women. The native copper of Lake Superior was beaten and stamped into shape for knives, awls, pendants, and breastplates, which found their way by trade over large areas. Meteoric iron and nugget gold were used, when they could be found, but iron in the ordinary sense was unknown, and in spite of contrary assertions there is no good evidence that any of the tribes within the limits of the United States understood either smelting or gold-washing. Since the advent of the whites, however, the Navahos have developed a considerable silver-working art, melting down silver coins for the purpose. Pottery and basketry were made by nearly all the tribes excepting those upon the plains, the Pueblo pottery and California basketry being especially beautiful. Weaving, for which the Navahos have become so famous, was a native art among the Pueblos, the material used being a

species of wild cotton. Some of the Eastern Indians spun and wove cordage from various vegetable fibres and the hair of animals, while feather weaving was also practised among a few tribes. The labors of war, hunting, the making of weapons, canoes, and traps, the heavier house building, and a part of the agricultural work were assumed by the men, while upon the women devolved the care of the household, the procuring of wood and water, the setting up of the tipi, the skin dressing and sewing, the pottery and basket making. The dog is the only animal certainly domesticated before the coming of the whites, with the exception of certain birds kept for their feathers.

Dress.—The differences of dress among the tribes were chiefly a matter of minor detail. In general the Indian wore but little clothing. The ordinary costume of the Eastern warrior consisted of a fringed shirt of buckskin, leggings and moccasins of the same material, and a breechcloth around the loins, with beads, pendants, feathers, and paint as his fancy dictated. In some tribes tattooing was practised. Some tribes allowed the hair to fall loosely at full length, others wore it in two long plaits hanging down in front; others again cut it off just above the eyes, and others shaved nearly the whole head. Everywhere east of the Rockies the scalp lock was worn, a small plait of hair hanging down behind from the very centre of the head, and elaborately set off with pendants and other ornaments. This was the trophy so eagerly prized by the warrior as the evidence of victory over his enemy. The woman's dress consisted usually of a short-sleeved tunic, belted in at the waist, with leggings and moccasins made in one piece. Among the Hopi the unmarried girls were distinguished by a peculiar arrangement of the hair, somewhat resembling the outspread wings of a butterfly. Children usually went naked until about the age of ten years. Head flattening was common among the Choctaws and some Carolina tribes, and almost universal among those of the lower Columbia and Puget Sound.

Games and Ceremonials.—The time not occupied in war, hunting, or other serious occupations was largely given over to ceremonial feasts and dances and to games of various sorts. Many dances were religious in character, while others were purely social. Among those most often noted were the war dance, the scalp dance, the solemn thanksgiving of the green corn dance, the great annual sun dance of the plains tribes, and the snake dance of the Hopi. The dance usually began and ended with a feast. The ball play was the chief athletic diversion of the Eastern tribes, and was played with a ball and a netted ballstick somewhat resembling a tennis racket. Next in popularity came the game known among some of the Gulf tribes as *chũnki*, played with a small stone wheel and a stick curved at one end, the object being, by a nice calculation of speed, to slide the stick after the wheel in such a manner that both would fall together at a certain point. Target shooting and foot races were also common, while at night both sexes played hunt-the-button games, moving their hands in time to the accompaniment of a song. The women had also their own games, such as football, shinny, and a sort of dice played with marked pieces of wood or bone, and the awl game, played around a blanket on which were painted lines and dots to indicate the score. Gambling was a part of every contest, and the Indian would stake his last possession upon the result. Children imitated their elders, the boys practising upon prairie dogs or grasshoppers with their small bows, the girls learning to cook and sew under the instruction of their mothers, or building little play-houses for their buckskin dolls. All Indians were very fond of music, and there were songs for every occasion, the principal instruments being the drum, rattle, flute, and whistle.

Mortuary Customs.—The various methods of disposing of the dead depended chiefly upon the necessities of environment and the religious ideas of the particular tribe. Inhumation, either immediate or final, was probably most general, but almost every other method known in any part of the world was also practised. Ordinary inhumation prevailed among the Eastern tribes, but with the Choctaws and Nanticoques the body was only temporarily buried until the flesh had rotted, when the bones were dug up, carefully cleaned, and tied into bundles, which were thereafter kept always in the house of the surviving relatives. The Hurons exposed the body upon a scaffold until the recurrence of the annual Feast of the Dead, when all the skeletons were collected and the bones deposited in a common sepulchre. Burial mounds in the Eastern States give evidence that this custom was once quite general. Among some of the ancient Southern tribes the mummified bodies were preserved in dead-houses, guarded constantly by priests. On the plains the corpse was sometimes laid away in the branches of a tree, while among the Winnebagos and Eastern Sioux it was placed in a bark coffin upon the surface of the ground. On the lower Columbia the body was usually deposited in a large canoe, supported upon a platform, a smaller canoe being inverted over the bundle to keep off the rain. Cremation was general in the arid region of Nevada and the lower Colorado. In every case the property of the deceased was buried with him, or otherwise destroyed, together with his horse, dog, and sometimes—in the Columbia region—his slaves or even his wife. Food also was

frequently placed near the grave for the use of the soul while on its journey to the shadow world, and some tribes kept a small fire burning for several nights to light the soul on its way. The relatives cut off their hair to throw it as a last offering upon the tomb, and women gashed their arms and bodies with knives in token of their grief. During the period of mourning the friends neglected their personal appearance, and every night and morning the women retired to some solitary place to wail over their loss. The name of the dead was never mentioned if it could be avoided.

Government and Religion.—Excepting perhaps among certain Western tribes Indian society was based upon the clan. Under this system the tribe was organized into family groups or clans, all the members of one clan being considered as near relatives. Those of the same clan were not allowed to intermarry, and descent was almost universally reckoned in the female line. Certain hereditary duties or privileges were frequently in the keeping of particular clans. Chieftainship was hereditary, but the warriors never hesitated to set aside an incompetent successor, and the ordinary war captain held authority solely through personal merit. Women frequently occupied a high position in the scheme of government. Among the Iroquois no important measure could be enacted over the veto of a council of the mothers, and among the Cherokees the "war woman" had the power of life or death in regard to the fate of captives, and spoke in councils with as much authority as the chiefs. Female rulers were frequent among the Southern tribes, a notable instance being that of the queen of Cofitachiqui, mentioned in the De Soto chronicles. Tribes were sometimes united into confederacies, often of complex organization, as in the case of the celebrated Iroquois league. There were numerous military orders, dance societies, and secret medicine fraternities.

Indian theology had no supreme god, such a conception being far above the mental stage of the savage, but his imagination saw in every animal, tree, rock, and power of nature its own deifying anima, which he invoked for help or protection as the occasion required. The animal gods were naturally appealed to most by the hunter, while the agricultural tribes invoked the gods of the rain and the wind, and all alike, from ocean to ocean, paid reverence to the sun as the most glorious manifestation of superhuman power and beneficence. By the nomads of the plains the buffalo was regarded as an animal personification of the sun, while with the Pueblos, as among some oriental nations, the snake was an embodiment of the rain god. The celebrated Hopi snake dance was in reality a solemn prayer for rain upon the crops. There was frequently a tribal palladium, and every individual had also his own protecting "medicine." The sacred rituals were usually couched in an archaic dialect fully understood only by the priests, who refused to reveal the secrets to any but their own initiates. Abstract morality had but little place in the system. Among the tribes of northern California, as appears from recent researches of Professor McGee, there was found a peculiar language cult, under which the tribal dialect was regarded as a living entity, in which was centred the social custom and very existence of the tribe itself.

INDIANS OF THE UNITED STATES, OFFICIAL REPORT ON. The report of the Commissioner of Indian Affairs for the year ending June 30, 1899, shows an aggregate appropriation of \$8,237,675, of which a little less than half was used in the fulfilling of treaty obligations and for the support of schools. Appropriations for the current year ending June 30, 1900, amount to \$7,678,963, a decrease of \$558,812 below the expenses of the year 1898-99. The questions given the fullest attention in the report of the commissioner are the progress of education, Indian commissions, allotments and sales of lands, the work of irrigation on the various reservations, the sale of liquor to the Indians, Indians exhibited at expositions, etc., and the matter of guardianship for citizen Indians.

Education.—The guardianship of the American Indian assumed by the United States government is not a policy of mere sentiment, but a recognition of the justice of his claim to be given a support by those who had taken from him his means of subsistence. In the scheme of government protection education has been found the most powerful factor in fitting him for the benefits of civilization. The educational system is therefore a broad and comprehensive one, and includes studies of a more practical nature than those generally taught the white boy and girl in our public schools. The success of the Indian school may be inferred from the words of the commissioner: "Of the children attending the public schools of any of the great cities which draw their material from the slums, a greater percentage sink back into the degradation of their parents and revert to the life from which they were taken, than is the case with the Indian boys and girls who have received proper training in Indian schools." At present the principal objection to Indian education lies in the fact that adequate provision cannot at all times be made for the future of the student. "The government lays the foundation, and the pupil must thereafter build his own superstructure." The entire educational system of the Indian office is predicated upon the

final abolishment of the Indian reservation system. Since the dignity and necessity of labor are taught, along with mental and manual instruction, it is hoped that the present generation of young Indians may become self-supporting, and learn to appreciate individual rather than communal holdings. "When this result has been accomplished," says the commissioner, "the necessity for Indian reservations will cease." While the Indian population has remained stationary, there has been such a steady increase in the number being educated that the commissioner hopes that during the next quarter century there will be not a diminution of the Indian "population," but an extinguishment of Indian "tribes."

With an appropriation for the year of \$2,638,390, the enrolment and average attendance at the Indian schools were 25,202 and 20,522 pupils respectively, included in 206 schools of all classes. The following table exhibits the attendance for the fiscal year 1899, compared with the fiscal year 1898:

KIND OF SCHOOL.	ENROLMENT.			AVERAGE ATTENDANCE.			Number of Schools in 1899.
	1898.	1899.	Increase.	1898.	1899.	Increase.	
Government schools:							
Nonreservation boarding	6,175	6,890	705	5,347	6,004	657	25
Reservation boarding	8,877	8,881	4	7,532	7,433	* 99	76
Day	4,847	4,951	104	3,286	3,281	* 5	142
Total	19,899	20,722	823	16,165	16,718	553	243
Contract schools:							
Boarding	2,509	2,468	* 41	2,345	2,159	* 186	26
Day	96	42	* 54	68	39	* 29	2
Boarding specially appropriated for ..	394	393	* 1	326	335	9	3
Total	2,999	2,903	* 96	2,639	2,523	* 116	32
Public	315	386	11	183	167	* 16	(+)
Mission boarding †	597	1,079	182	783	980	177	18
Mission day	215	183	* 32	145	154	9	3
Aggregate	24,325	23,908	877	19,915	20,522	607	296

* Decrease.

† Thirty-six public schools in which pupils are taught not enumerated here.

‡ These schools are conducted by religious societies, some of which receive from the government for the Indian children therein such rations and clothing as the children are entitled to as reservation Indians.

Of the 206 schools conducted under various auspices, 243 are exclusively under the control of the Indian Department, an increase of one in the number of government schools. In 1899 the present value of government schools was \$3,562,760.

The growth in average attendance from 3598 pupils in 1877 to 20,522 in 1899 is an actual growth, the population having remained practically stationary during that time. The average attendance in 1898 was 19,648.

Indian Exhibitions.—In a number of instances the department has granted authority for the taking of Indians from their reservations for exhibition or show purposes. Thus, Mr. Cody ("Buffalo Bill") and Mr. Salisbury took 100 Indians from the Pine Ridge and Rosebud reservations, South Dakota, for general show purposes, giving a bond in the sum of \$10,000. Fifty Jicarilla Apaches and 40 Utes were sent to the Denver Carnival in October, 1898. In these and similar cases permission has been granted upon condition that the government shall be under no expense, and that the Indians could be spared without detriment to their interests. The commissioner puts himself on record in this report as strongly opposed to the practice of granting the increasing demands for Indians for show purposes. The demoralizing effect of promiscuous exhibitions is pointed out as largely offsetting the work of elevating and civilizing the Indians. Civilized Indians are not wanted by the show people, and the Indians are thus taught that savagery has a market value and is worth retaining. "The boys in the day school know it, and speak longingly of the time when they will no longer be required to attend school, but can let their hair grow long, dance Omaha, and go off with shows."

Allotments and Patents.—During the year patents were issued and allotments confirmed among a number of tribes on reservations. Regarding the allotments made outside of reservations, investigations were continued concerning alleged fraudulent Indian applications, particularly in Minnesota and Wisconsin. There were originally 400 of these applications, most of which have been made by mixed bloods, in order to obtain the timber or for speculative purposes. Many fraudulent

applications have already been cancelled; others found to be made in good faith have been allowed to stand.

Commissions.—The work of commissions included conferences among the Crows, Flatheads, etc., the Chippewas, the Puyallup Indians, and the Five Civilized Tribes. The commission to the Five Tribes, otherwise known as the Dawes Commission, under the authority of the act of June 10, 1896, continued to exercise jurisdiction over citizenship matters in the Five Civilized Tribes. This act ordered the commission to hear applications and determine the eligibility of all persons petitioning for citizenship in any of the said nations. On November 29, 1898, it was decided that the jurisdiction of the commission superseded whatever jurisdiction may have been possessed by the tribes previous to the act. It is necessary, however, according to a recent ruling, that enrolments of the commission shall be approved by the secretary of the interior. The rolls of the Choctaw, Chickasaw, and Seminole Indians are about completed, but have not yet been submitted. An enrolment of the Mississippi Choctaws, who have been identified under a clause in the act, has been submitted, but not yet approved. The Choctaws of Mississippi retain their right to enrolment in the Choctaw nation, provided they remove and settle among that tribe in the Indian Territory. They shall not, however, be entitled to receive annuities. Provision was made in 1899 also for the allotment of all the tribal lands of the Territory equally among all the citizens. It was provided, in this connection, by an act of July 1, 1898, that the United States should secure from the Creek nation the cession of such an amount of land adjoining the Seminole lands as when added to their present reservation would give to each Seminole an adequate allotment. The Dawes Commission reported, however, that the Creek legislature had not responded and that in their opinion it would be impossible to secure from the Creeks any cession of lands for the purpose named. In pursuance of the per capita allotment of the lands of the nations in the Indian Territory, the commission has appointed a large number of appraisers, and is now engaged in appraising the lands of the Choctaw and Chickasaw nations and of the Seminole nation with a view to permanent allotment within those nations under their several agreements. Among the most important matters, perhaps, of all the duties to be performed under the Curtis act, are the matters of town-site provisions. This is especially so on account of the opportunities in the execution of this law for land-grabbing in the way of claims to lots, etc. The importance of this matter of laying out, surveying, appraising, and selling the lots of the towns is demonstrated, says the commissioner, by the fact that the people in the Indian Territory very soon after the passage of the Curtis act took a feverish interest in town-site affairs and seemed to regard the town-site provision as far overshadowing the others. It may be recalled that by this statute white residents in the Territorial towns, who had previously been unable to obtain title, can now purchase at a fair appraisal the land upon which they have built their homes and business houses. In regard to land-grabbing, warning has been given that good faith must be proved in every instance in order to secure title to lots. The laying out of towns has been facilitated during the year by two congressional appropriations and the appointment of two town-site commissioners, one to the Choctaw nation and one to the Chickasaw. On account of the small appropriation and of the strong opposition in the Cherokee and Creek nations, no commissioners were appointed for those nations. The town of Muscogee, of the Creeks, was destroyed by fire early in 1899, and on petition a commission was appointed to lay out this town. This is one of the most important towns in Indian Territory. It has between 5000 and 6000 inhabitants, and is the headquarters of the Union Agency, the Dawes Commission, and the inspector of the Indian Territory. It is also a place of session for the United States Court. The town of Wagoner also experienced a destructive fire, and a commission has been appointed for that place. See INDIAN TERRITORY.

As to the work of other commissions, the cession of lands to the United States by the Flathead and Yakima tribes has not yet been brought about. The Crow Indians, however, agreed in August, 1899, to cede the northern portion of their reserve, comprising about one million acres, for \$1,150,000. About 200,000 acres lie along the Big Horn and Yellowstone Rivers. The commission to the Chippewa Indians continued during the past year the work of allotting lands on the White Earth reservation. This work was finished in the fall of 1899. The Puyallup commission had sold and reported to the Indian Bureau up to June 30, 1899, about 1884 acres of land in the reservation to which they were appointed, the sale price being \$98,859. The Puyallup Indians also consented to the sale of an agency tract of 598 acres, excepting a portion reserved for church, school, and farm purposes. The remainder was surveyed and platted into lots and blocks as an addition to the city of Tacoma.

Miscellaneous.—Since the passage of the act of January 30, 1897, prohibiting the sale of intoxicants to Indians, the Bureau of Indian Affairs has been able to cope

in a large degree with illicit liquor sellers. During 1899 many prosecutions were instituted and numerous convictions obtained. The Department of Justice conducted several investigations, notably among the Seminoles in Florida and the Chippewas of the Leech Lake Agency, Minn. An injustice to the Indians, mentioned in the 1899 report, is the generally irresponsible character of administrators and guardians and their sureties, appointed or approved for citizen Indians by local courts under the method now in vogue. Instructions have been sent to all Indian agents and school superintendents having citizen Indians under their care. These men are directed to co-operate with their county probate judge, and if possible effect an arrangement whereby in the future only such administrators and guardians as first meet with their approval and whom they adjudge to be proper persons as guardians shall be appointed. They are also directed to examine their records and ascertain the name and character of all holding these positions of trust. If these guardians are found to be irresponsible or improper, the payments of annuities shall be withheld, subject to future disposition for the benefit of the annuitant under the direction of the Indian office.

The chief work of the year in irrigation was the conclusion of an agreement for the completion of the irrigation system of the Crow Indians. The sum of \$100,000 of the grazing fund of the tribe was set aside for this purpose. Miscellaneous appropriations of small amounts have been expended during the year for irrigation, among the Indians, as follows: Southern Ute in Colorado, Uintah in Utah, Wind River in Wyoming, Yakima in Washington, Flathead in Montana, Pyramid Lake in Nevada, Navajo in Arizona, Lemhin in Idaho, San Carlos in Arizona, Western Shoshone in Nevada, Colorado River in Arizona. The first act of Congress authorizing the construction of a telephone line through Indian lands was passed on February 9, 1899, and grants the Missouri and Kansas Telephone Company the right to construct and maintain lines and offices for general business purposes in the Ponca, Oto, and Missouria reservations in the Territory of Oklahoma. The company shall pay the natives or tribes through whose territory its line extends the sum of \$5 for each ten miles of line constructed and maintained. The most important matter of legislation during the past year in connection with the railroads across Indian lands was the passage of the act of Congress of March 2, 1899. Under the provisions of this act, and subject to the rules of the Indian Department, authority has been granted for the survey of railway lines through Indian lands to the following companies: Arkansas Valley and Gulf; Gulf and Northern; Kansas, Oklahoma, and Texas; Rio Grande, Pagosa, and Northern; St. Louis, Tecumseh, and Lexington; Shawnee, Oklahoma, and Indian Territory; Tecumseh and Shawnee; Eastern Oklahoma, and Chicago, Milwaukee, and St. Paul. Special railroad grants made since the last report include: In Indian and Oklahoma Territories: Arkansas and Choctaw, Little River Valley, and Fort Smith and Western railroads; Nez Percé Indian lands: Idaho-Clearwater and Clearwater Short Line railroads; Omaha and Winnebago reservations: Sioux City and Omaha Railroad.

INDIAN TERRITORY, an unorganized Territory of the United States, set apart by Congress in 1834 for Indian reservations, originally had a land area of 69,830 square miles, from which 38,830 square miles were taken in 1890 to form Oklahoma Territory (*q. v.*).

Mineralogy.—Coal continues to be the chief production, the peculiar laws of Congress applicable to the Territory, and based on the treaty rights of the different Indian nations, preventing a general exploitation of other known mineral resources. Mining operations are carried on under lease from the Chickasaw and Choctaw nations. During the calendar year 1898 the output of 22 mines was 1,381,466 short tons, valued at the mines at \$1,827,638, an increase in a year of 45,086 tons, and the largest in the history of the Territory. Commercial sales aggregated 1,310,178 short tons. Prior to 1898 the operators had been paying a royalty of 17¾ cents per short ton of screened coal, a rate nearly three times the average rate paid in competitive fields. Early in 1898 the royalty was fixed by agreement and ratified by Congress at 15 cents per short ton for mine-run coal. Operators claimed that this rate was practically prohibitive, and an appeal to the secretary of the interior secured a reduction by that officer to 10 cents per short ton of screened coal, in January, 1899. Funds arising from lease of mineral lands and from royalties on output of coal and asphaltum are reserved for schools for children of Indian blood, excluding colored freedmen; and the mineral royalties received in the fiscal year ending June 30, 1899, aggregated \$110,145, which was placed to the credit of the Chickasaw and Choctaw nations. See ASPHALTUM.

Manufactures.—During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$24,241. There were 9 cigar factories, which had a combined output of 232,600 cigars. The coking industry showed a healthful development during the calendar year 1898, when two plants

with 130 ovens used 73,330 short tons of coal, and produced 34,110 short tons of coke, valued at \$96,639, the largest output in the history of the Territory.

Education.—For the first time in the history of the Indian Territory a general superintendent of its schools was appointed in February, 1899, to have a general supervision of all Indian schools, with supervisors in the Choctaw, Chickasaw, Creek, and Cherokee nations. This action was taken on the urgent and repeated recommendations of the Dawes Commission and of successive secretaries of the interior department, who had represented that a most serious condition existed by reason of the great number of non-citizen children who are growing to manhood and womanhood without school advantages. At the close of the school year 1897-98 there were 3 public high schools, with 9 secondary teachers, 98 secondary students, and 381 elementary pupils, and 9 private secondary schools with 24 teachers, 416 secondary students, and 1305 elementary pupils. Two colleges for men and for both sexes reported 20 professors and instructors, 134 students, \$60,000 invested in grounds and buildings, and \$13,800 in total income. Of two boarding schools maintained by the federal government, that of the Quopaw Agency, 7 miles from Baxter Springs, Kan., had capacity, 90; enrolment, 119; average attendance, 96; teachers, 4; farm land, 325 acres, and school buildings valued at \$11,570; and the Seneca School, at Wyandotte, had capacity, 130; enrolment, 145; average attendance, 130; teachers, 4; farm land, 160 acres, and school buildings valued at \$19,683. There are no available reports of the schools maintained by the several nations. In 1889 there were 79 periodicals, of which 5 were dailies and 72 weeklies.

Banks.—On October 31, 1899, there were 15 national banks in operation, the full number organized. The active capital was \$860,000; circulation, \$215,518; deposits, \$1,884,618; and reserve, \$569,533. Seven private banks, June 30, 1899, had capital, \$90,000; deposits, \$219,426; and resources, \$330,762.

Railways.—The new railway construction during the calendar year 1898 was 61.67 miles and during 1899, 78.99 miles, giving the Territory a total mileage of 1342.59. Congress passed a general enabling act (approved March 2, 1899), by which any company may acquire right of way through Indian lands for railroad, telegraph, or telephone lines by complying with the regulations of the interior department. Under this act the department granted authority to the Arkansas Valley and Gulf, the Gulf and Northern, and the Kansas, Oklahoma, and Texas railroads to build across Indian lands in the Territory, and special acts granted rights of way through the Choctaw, Chickasaw, and Creek nations to the Little River Valley and the Fort Smith and Western railroads.

Work of the Dawes Commission.—The annual report of the commission to the Five Civilized Tribes for the fiscal year ending June 30, 1899, shows greater progress in the work of the commission than during any preceding year. Much of it is taken up with the narrative of proceedings under the Curtis act of Congress regarding the new agreements with the respective nations. The most difficult and complex duty devolving upon the commission is that of preparing the citizenship rolls of the various tribes, to determine exactly who are citizens under classifications recognized by Congress. These rolls not only contain the names of legal citizens, but a description of each one to aid personal identification. An interesting part of the report politically is the opinion of the commission regarding the immediate future of the Territory. The time has not yet arrived for the installation of either a Territorial or a State government. The lack of uniform land tenures is urged against the measure, as the class ownership of the soil is confined to approximately 85,000 citizens as against approximately 400,000 non-citizens who do not own a foot of land, save as provision has been made recently for the sale of town lots. An agreement with the Seminoles, ratified by Congress July 1, 1898, permits the continuance of the Seminole government in a limited way, and one with the Choctaws and Chickasaws explicitly extends their government till March 4, 1906. Other complications exist which would render impracticable the immediate establishment of a new form of government. See INDIANS OF THE UNITED STATES, OFFICIAL REPORT ON (paragraph Commissions).

Population.—Reports of the population of Indian Territory are unsatisfactory, even official reports being obscure and contradictory. The secretary of the interior, however, reported on November 27, 1899, as follows: "The Five Civilized Tribes, numbering 62,500, with 18,000 freedmen and a white population of 200,000, inhabit Indian Territory."

INDO-CHINA includes the French possessions on the Anamese or Indo-Chinese Peninsula—namely, Anam, Cambodia, Cochin-China (French, or Lower), and Tonquin, of which separate accounts will be found under their respective headings. Indo-China is administered by a governor-general, M. Paul Doumer, resident at Hanoi, and a superior council, which decides upon the budget of Cochin-China, and advises regarding the budgets of Anam, Cambodia, and Tonquin. The total area is estimated at 196,422 square miles, and the population at 21,752,034. France has de-

veloped a large trade with Indo-China, and under the protection of the French tariff laws imports from France are said to have trebled within the past ten years. In 1898 French imports into Cochinchina amounted to \$4,800,000, and the exports to France were \$3,400,000. The principal imports are tissues, passementerie, and cotton ribbons; other items include wine, tools, etc., woollen goods, toys, fans, and other manufactured articles. Exports are rice, pepper, raw hides, exotic resins, copra, cocoa, volatile oil or essences, and albumen. Rice, by far the most important, was valued in 1898 at \$2,409,847. This article makes up four-sevenths of the exports, and fish makes up nearly two-sevenths. The trade policy of France in Indo-China aroused considerable interest in 1899 through the efforts of Governor-General Doumer to create a large Indo-Chinese loan in France for railway development in these colonies. A bill providing for a loan of 200,000,000 francs was finally passed late in 1899 by the French Assembly, the revenues of the colony to be collateral for the loan and the interest thereon; the first issue, 110,000 500-franc 3½ per cent. bonds, was immediately subscribed for by the French public. The railroads to be built under the new loan are from Haiphong to Hanoi and Kaokay (300 miles); from Hanoi to Nam-Dinh and Vinh (240 miles); Tourane to Hué and Quang-Tri (150 miles); Saigon to the Khanh-Hoa and Lang-Bian, and Mytho to Cantho. Construction was to begin at once. A line 300 miles long, between Tonquin and Yunnan, is expected to extend French influence over Yunnan, and develop coal, copper, and tin mines there. China is said to have been induced to agree to build this railroad, with the help of French engineers. These various new roads—together with the Anamese Railroad, which has already been extended into China by virtue of the Franco-Chinese treaty of 1895 (see CHINESE EMPIRE) are expected to play an important part in the development not only of Indo-China itself, but of the trade of the French. Referring to the matter in a speech before the Paris chamber of commerce, Governor-General Doumer said: "As governor-general, I have, in the interest of the colony, expended all I possibly could in public works. We have expended not less than 1,000,000 francs in irrigating the soil, and 2,000,000 francs in cutting canals, making rivers navigable, and building railroads," and added that the loan of 200,000,000 asked for further development could not be considered as so much money withdrawn from circulation, since more than two-thirds of it would be expended in France, thus enriching French industries.

INFLUENZA, EPIDEMIC. During December, 1899, there were 342 deaths in London, England, from la grippe, or epidemic influenza. The epidemic of this disease increased during the last quarter of the year. Of these 342 deaths, 193 were registered during the last week in the month. The greatest proportional mortality was found in Paddington, St. George's, and Marylebone, from which one must infer that the richer classes have suffered most severely. As a majority of the cases of influenza were typical, it was possible to prevent to some extent the spread of the infection to the public as well as the exposure of the patients to unfit environment. The average number of deaths from influenza in London during December for the past ten years has been 100. See PSEUDO-INFLUENZA; THERMOL; VITAL STATISTICS.

INGERSOLL, Colonel ROBERT GREEN, the eminent lawyer and orator, died at Dobb's Ferry, New York, July 21, 1899. His life was not so crowded with stirring incident that much discussion thereof was awakened by his death; but comments on the man's intellectual beliefs and ethical teachings were very widely made in the pulpit and the press. Robert Ingersoll was the son of a Congregational minister, and was born at Dresden, N. Y., August 11, 1833. He received a common school education, studied law, and, the family having removed first to Wisconsin and in 1845 to Illinois, was admitted to the bar in the latter State. In 1857 he began the practice of law in Peoria with his elder brother, and entered into politics as a Democrat. As a lawyer he soon was recognized as an excellent counsel in railroad litigation. In 1860 he was nominated for Congress, but after a brilliant campaign was defeated. Having entered the Union service in 1862 as colonel of the Eleventh Illinois Cavalry, he participated in two battles, and was captured by Forrest's cavalry. Upon his release he returned to his practice of law and became a Republican in politics; in 1868 Governor R. J. Oglesby appointed him attorney-general of Illinois. His reputation became national in 1876, when, in a masterly speech in the Republican national convention at Cincinnati, he nominated James G. Blaine for the Presidency. The following year he declined to accept from President Hayes the position of minister to Germany. After this time he successfully practised law in Washington and in New York. His defence of the so-called star-route conspirators in 1883, securing for them acquittal, added to his reputation as an advocate. For many years, however, and up to the time of his death, he was most widely known as an eloquent opponent of the Christian religion.

As an orator Ingersoll was pre-eminently a rhetorician. This fact, together with his wit, vigor, and personal "magnetism," gave him a power to interest and persuade

an audience that was equalled by few men of his time. It should be added, however, that this influence, particularly among the better educated classes, rarely extended much beyond the actual time of his speaking. Some of his orations on literary subjects—as, for example, the one on Shakespeare—gave evidence that while Ingersoll was far from being an acute literary critic, he was a man of great literary sensibility. His sentences were euphonious and florid, addressed to the ear; his thought took little account of the necessity of sound premises; it was lacking in logical consecutiveness and appealed to the emotions rather than to the judgment. He possessed a remarkable spontaneity of diction and strength of expression; he was wont to employ sarcasm often marked by a certain cheap smartness of phrase. It was to a great extent by these qualities that his influence was extended over that class of thinkers which does not care to be hampered by logic.

But Ingersoll, the controversialist, cannot be set aside with such generalization. Concerning God and a future life, his tone was usually against their possibility, though at times this atheistic position seemed to be superseded by a view more akin to agnosticism. The crux of his discussions lay in the fact that he considered the Christian religion not as a system making for righteousness and aspiration, but as a set of crystallized and unchanging dogmas based on Hebrew mythology and the credulity of the early church. The God against which he spoke was "Jehovah"; the scriptural inspiration he opposed was literal and special inspiration; the punishment for sin he decried was the ancient conception of physical punishment rather than the more recent and more philosophical idea of spiritual retribution.

His lectures will not have an abiding place in the literature of disbelief and agnosticism; he was not philosophic like Hume, or subtle like Voltaire, or broadly scientific like Herbert Spencer; moreover, he was wanting entirely in the power of construction that has marked the idealistic philosophers. He was a vigorous rhetorician, and he employed his talents solely in the work of destruction. Among his publications, which consist almost wholly of his lectures, are: *The Gods and Other Lectures*, 1876; *Some Mistakes of Moses*, 1879; *Prose Poems*, 1884; *Great Speeches*, 1887; *The Bible*; *Ghosts*; *Foundations of Faith*.

INHIBITION. See **PSYCHOLOGY**, **EXPERIMENTAL**.

INMAN, Colonel HENRY, author, plainsman, and soldier, who died at Topeka, Kan., November 13, 1899, was born in New York City in 1837. His father, Henry Inman, who was president of the National Academy of Design, and his brother, John O'Brien Inman, were well-known artists. Colonel Inman went West when a young man and became an associate of Colonel W. F. Cody ("Buffalo Bill"). He saw much Indian fighting in the company of Colonel Cody and in the service of the United States Army. He entered the army in 1857, and served in the Indian campaigns in the Far West up to the breaking out of the Civil War. In the Army of the Potomac he served as aide-de-camp to General George Sykes, commanding the division of the regulars of the Fifth Corps. He was severely wounded before Richmond, and was brevetted for gallantry in action. He was successively promoted to be major and lieutenant-colonel, the latter appointment being given for his services in the Indian winter campaign of 1868-69. Colonel Inman's writings, which brought him some literary fame and which met with considerable success, reflect the period of his life and adventures on the Western plains. His last book, *Buffalo Jones*, was published during the year 1899. Other books written by him are: *The Old Santa Fé Trail*; *The Ranch on the Ox-hide*; *Tales of the Trail*; *A Pioneer from Kentucky*; *The Delahoyles*; and *The Great Salt Lake Trail* (written with W. F. Cody).

INSANITY. Statistics show that there are 58 insane Indians in this country out of a total of 250,000 Indians. Of the 58 but 7 are now under care and treatment in various retreats. At the 1898-99 session of Congress an appropriation was made of \$42,000 for the erection of the first Indian insane asylum in the country, as well as an additional \$3000 for suitable grounds. A site was chosen in Canton, S. D., and work was begun on the structure in August, 1899. This action became necessary because of the absence of claim upon State asylums held by these wards of the government.

The Asylum Committee of the London County Council issued in December, 1899, its report for the year ending March, 1899. This council has under its charge the asylums at Banstead, Cave Hill, Clayburg, Colney Hatch, and Hanwell, sheltering a total of 15,000 patients. The increase in this total during 1899 was 500. The council is erecting two more large asylums at Bexley and Horton, with a view to future requirements. The London medical schools are allowed to use the great mass of psychological material thus available for practical teaching purposes.

INSECTS AND THE PROPAGATION OF DISEASES. The recent agitation of the question of the propagation of malaria by mosquitoes has called the attention of the lay world to the patient investigation of this matter by Italian scientists

during 1899. The theory upon which they and many other investigators worked is not new. It is claimed that it was first advanced by Crawford, an American, in 1807, and again independently by an American, Dr. A. F. A. King, in 1883. Finally the fact of the propagation of malaria by mosquitoes has been established by Manson, Ross, MacCallum, Bignami, Bastianelli, Smith and Kilbourne, Laveran, Koch, Grassi and others.

Simond's investigation regarding the spread of the plague, coupled with the results obtained by Yersin, favor the theory that the spread of this fell disease from rat to man is accomplished by the flea. Nuttall fed the bacillus of the plague to flies, and ascertained that they can carry the infection to man. Kobler's experiments lead him to accuse the ant of assisting the flea and the fly in this matter. In the matter of the mosquito transmission of malaria, the names of Manson and Ross should be specially mentioned, as their studies were perhaps the most painstaking and accurate. Kaposi has instanced a case of leprosy following a mosquito bite. The experiments of Alvarez, as quoted by Carmichael, support this theory of leprosy transmission. Carmichael believes that this disease may also be communicated by the bed-bug and the fly. Boeck favors the theory that the itch-insect is an active agent in the spread of leprosy. Smith and Kilbourne established the fact that the tick propagates Texas fever. A brother of a patient who had died of tuberculosis became infected with the same disease after sleeping in the dead man's bed. Denevre found that 60 per cent. of the bed-bugs that infested this bed had the power of infecting guinea-pigs with tuberculosis. Tiktin demonstrated the presence of the spirillum of relapsing fever in the blood of bed-bugs which had preyed upon a patient suffering with that disease. Moran, during experiments upon mice, reached conclusions warranting the statement that bed-bugs may disseminate cancer. The bacilli of anthrax (malignant pustule) has been found in flies, in fleas and in earthworms.

Thus, it is seen, insects propagate disease in two ways: (1) As carriers, bringing infection to a wound or to food and drink on the surface of their bodies, after crawling over an infected spot, or bringing the infection in the form of bacilli in their intestinal tracts; (2) as intermediary hosts, bringing to the victim the infection in the fluids of their bodies and inflicting wounds through which the poison is introduced into the body of the victim. The mosquito is a true intermediary host. The protozoa Labbe, taken up from the marsh, undergoes some alteration in the stomach of the mosquito, and ultimately reaches the venimo-salivary gland, from which the lancet of the mosquito, anointed with saliva, transmits the poison to the victim. Very important and interesting experiments have been made by Professor W. M. L. Coplin, M.D., of Jefferson Medical College of Philadelphia, in 1899, in the line of researches made by Sangree. He caused roaches, flies, and bed-bugs to walk over cultures of various disease germs, and then to walk over sterile agar plates, many hours later, having been kept in the meantime in large jars, under as natural conditions as possible. Examinations of the agar plates made subsequently showed active cultures of the various bacilli of infection. The feet, the ventral portion of the body and the wings of the insects carry infection and plant the disease organisms in rows and small colonies throughout the surface of the sterile plates. Forty-eight hours of continuous infectivity was shown in the case of many disease germs thus transmitted. In one case the typhoid bacilli carried on the body of a roach retained their virulence for 96 hours. But one germicide has proved of avail in disinfecting bacteria-laden material, and this is formaldehyde. The great difficulty in rendering harmless the insect carrier of disease is easily appreciated. See MALARIAL FEVER AND MOSQUITOES.

INSTITUTE OF ELECTRICAL ENGINEERS, AMERICAN. See ELECTRICAL ENGINEERS, AMERICAN INSTITUTE OF.

INSTITUTE OF FRANCE, a French learned society, founded in 1795, comprises (1) the Académie Française (*q. v.*); (2) the Académie des Inscriptions et Belles-Lettres, organized for the study of archaeological and antiquarian questions, and has 40 members; (3) the Académie des Sciences, which has divisions for mathematical sciences, including geometry, mechanics, astronomy, geography, naval architecture, and general physics, and for physical sciences, including chemistry, mineralogy, botany, agriculture, anatomy, zoology, medicine, and surgery; (4) the Académie des Beaux Arts, which has divisions of painting, sculpture, architecture, engraving, and music, and (5) the Académie des Sciences Morales et Politiques, having sections of philosophy and ethics. The members of the various academies receive an annual stipend.

INTERNATIONAL BROTHERHOOD LEAGUE. See UNIVERSAL BROTHERHOOD.

INTERNATIONAL DATE-LINE. The cession of the Philippine Islands to the United States directed much popular attention to the difference in time between Manila and this country. Differences of local time, as, of course, every traveller

knows, exist between all places on the earth. But the manner in which they are to be computed is peculiar when the places in question are separated by very wide distances. That there should be such time differences is unavoidable in the very nature of things. We call noon the moment when the sun reaches its highest altitude in the sky; or, as astronomers say, "passes the meridian." But as the sun rises in the east and sets in the west it must necessarily pass over the successive meridians in the direction east-to-west. Thus, easterly places have their meridian or noon-time first. At any given moment, if it be noon at a certain town, all towns to the east of it have already passed their noon, and others to the west are still in the forenoon. Of any two places near each other, the more easterly has the later time.

But the earth is a round globe or nearly so. Consequently, if two places are separated by a whole hemisphere, it is difficult to say which is east of the other. It would be possible to travel from the first to the second, either by going east or by going west. Evidently the difference in time between the two places will depend upon which one we elect to call the easterly. Thus, it becomes really more or less a matter of choice as to how the decision is to be made.

Nearly all the maritime nations have tacitly agreed to use as the initial or fundamental line for counting time and longitude the meridian passing through the centre of the transit instrument in the British national astronomical observatory at Greenwich, England. Furthermore, it is the custom of navigators to calculate on the supposition that they are west of Greenwich, provided they are less than 180° of longitude west of that place. When a vessel travelling westward across the Pacific has passed the 180° degree of west longitude, it is customary to change the count abruptly to east longitude. As soon as 181° west is reached, 179° east is substituted for it in the ship's records. But according to the usual method of computing time differences, a ship in 180° west longitude will have a local time 12 hours earlier than Greenwich, while one in 180° east longitude will have its local time 12 hours later than Greenwich. Thus, when the longitude is changed suddenly from west to east the local time must also be advanced suddenly by 24 hours. Instead of being 12 hours earlier than Greenwich, it becomes 12 hours later. In other words, the date and day of the week are changed, Saturday, for instance, becoming Sunday. In travelling eastward, the same change is made in the opposite direction. The whole thing is thus quite simple so far as navigators are concerned. But it is different with the islands and settlements in the Pacific. These originally took their dates from the count of the ships discovering them. And as some of the early European navigators reached the Pacific by way of Cape Horn, travelling westward, and others around the Cape of Good Hope, travelling eastward, a sort of confusion of dates has arisen.

The present state of affairs is as follows: An arbitrary zigzag line has been drawn on the map of the world, passing through the islands near the 180° meridian of longitude. All places to the right of this line are counted in west longitude from Greenwich, and have what may be called the American date. Places on the left of the line are counted in east longitude, and have the Asiatic date, one day later. Unfortunately, cartographic authorities differ greatly in the delineation of this date-line. To have such a line drawn with perfectly definitive authority, it would be necessary for the great powers to have the line determined by a joint commission, and then to adopt the commission's recommendations by international agreement. This has never been done, so in one sense it may be said there is no *international* date-line. The term has, however, come into general use, and may well be employed pending such governmental action. The matter might be dealt with very appropriately if there should ever be another Prime Meridian Conference.

But in the absence of international agreement it is possible at least to mark out the line as it is actually used in the Pacific islands. For this purpose it is merely necessary to find out by correspondence with all the various settlements whether the date in public use is the American or Asiatic one. Strange to say, this was apparently not done until very recently. Professor George Davidson, of the University of California, and formerly of the United States Coast and Geodetic Survey, has made the necessary investigations, and his results have just been published in the form of a chart by the United States government. The international date-line as determined by Professor Davidson is indicated on the accompanying map. It is unquestionably the most authoritative date-line so far placed at our disposal. The reader will notice that there are few very important differences from the chart published in the YEAR BOOK for 1898. The principal change transfers Morell Island to the east of the line. The change of the Samoan Islands from west to east, which was made by order of King Malietoa in 1892, had been already noted in our chart of 1898. It may now be confidently expected that no further changes in the date-line will be required for a considerable period of time.

INTERNATIONAL FISHERIES CONFERENCE. See FISH AND FISHERIES.

INTERNATIONAL SPORTS. See SPORTS, INTERNATIONAL.

INTERNATIONAL YACHT-RACES. See YACHTING; SPORTS, INTERNATIONAL.

IOWA, a Western State of the United States, has an area of 56,025 square miles. The capital is Des Moines. Iowa was admitted to the Union, December 28, 1846.

Industries.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$2,003,256. There were 111 manufacturers of tobacco and 638 of cigars, and the total output was 68,839,847 cigars, 19,280 pounds of fine-cut, 373,299 pounds of smoking, and 672 pounds of snuff. Grain and fruit distilleries in operation numbered 4; the production of fruit brandy was 952 gallons; amount of spirits rectified, 78,720 gallons; distilled spirits gauged, 150,998 gallons, and production of fermented liquors, 187,892 barrels. During the calendar year 1898 the output of 187 coal mines was 4,618,842 short tons, valued at \$5,260,716, an increase over that of 1897 of 6977 tons, and the largest since 1888. Quarrying yielded sandstone and limestone to the value of \$531,648.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the delivery ports of Council Bluffs, Des Moines, and Sioux City aggregated in value \$132,581, an increase in a year of \$57,203; exports, none.

Railways.—The new railroad construction during 1898 amounted to 47.47 miles, and during 1899 to 582.66 miles, giving the State a total mileage of 9138.08. The equalized assessed valuation in 1899 was \$44,736,070, an increase of \$130,070 in a year.

Banks.—On October 31, 1899, there were 173 national banks in operation and 76 in liquidation. The active capital aggregated \$12,345,000; circulation, \$5,283,974; deposits, \$52,898,678, and reserve, \$17,605,207. The State banks, June 30, 1899, numbered 207, and had capital, \$9,073,170; deposits, \$29,257,807, and resources, \$40,800,100; private banks, 114, with capital, \$2,671,331; deposits, \$8,232,292, and resources, \$11,683,225, and stock savings banks, 195, with capital, \$7,801,000; depositors, 132,986; deposits, \$48,147,861, and resources, \$57,904,448. The exchanges at the United States clearing houses at Des Moines and Sioux City in the year ending September 30, 1899, aggregated \$118,794,117, an increase of \$17,626,215 in a year.

Education.—At the close of the school year 1897-98 the school population was 727,456; enrolment in public schools, 548,852, and average daily attendance, 370,845. There were 28,694 teachers, 13,775 buildings used as school-houses, and public school property valued at \$17,450,534. The revenue was \$8,746,925; expenditure, \$8,451,504, of which \$5,315,157 was for teachers' salaries. There were 326 public high schools, with 1001 secondary teachers, 26,262 secondary students, and 5562 elementary pupils; 44 private secondary schools, with 177 teachers, 2776 secondary students, and 3150 elementary pupils; 5 public normal schools, with 71 teachers and 2750 students in all departments, and 17 private ones, with 145 teachers and 4462 students. Normal training was also given in 12 colleges and 17 public high schools. Twenty-two colleges for men and for both sexes reported 8 fellowships, 177 scholarships, 431 professors and instructors, 6427 students, 130,506 volumes in the libraries, valued at \$145,600; \$287,850 invested in scientific apparatus, \$2,173,798 in grounds and buildings, and \$1,556,769 in productive funds; \$391,395 in total income, and \$153,356 in benefactions. In 1899 there were 1091 periodicals, of which 69 were dailies, 875 weeklies, and 90 monthlies.

Finances.—In 1899 the equalized assessed valuations were: Real estate, \$390,297,578; personal property, \$90,348,093; railroads, \$44,736,070; telegraph and telephone companies, \$1,028,836—total, \$526,410,577, a decrease in a year of \$17,837,205, largely on real estate. The bonded debt, January 1, 1899, was \$10,000, and by July 1 all outstanding warrants had been paid. The treasury had accumulated cash assets of \$464,462, and it also held a claim against the United States government amounting to \$43,435 for war expenses.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 2,212,000.

Party Platforms.—The Democratic platform was drawn up with great care by the convention at Des Moines, Ia., August 16, and had unusual significance for the country at large, because it was regarded as foreshadowing the positions that Mr. Bryan desired to have the national Democratic party assume in 1900 under his leadership and Presidential candidacy. It endorsed the Chicago platform of 1896 "in whole and in detail;" announced that the party would support Mr. Bryan; condemned trusts; approved the successful war with Spain, but deprecated and condemned war against the Filipinos; opposed "conquest of the Philippines because imperialism means militarism, because militarism means government by force, and because government by force means death of government by consent, the destruction of political and industrial freedom, and the obliteration of equality of rights and assassination of democratic institutions." It concluded with denunciation of letting convict labor by contract, urged a careful study of the existing liquor laws, and condemned the admin-

istration of Governor Leslie M. Shaw. The Populist convention, held also at Des Moines on August 16, had only about fifty delegates; they endorsed the Democratic platform for the fall campaign.

The Republican platform, adopted August 2, commended the National Administration; declared that "the monetary standard of this country and of the commercial world is gold. The permanence of this standard must be assured by Congressional legislation, giving to it the validity and vitality of public law. All other money must be kept at a parity with gold. And we urgently call upon our senators and representatives in Congress to lend their best endeavors to enact these propositions into law." It denounced the Chicago platform and its declarations in favor of free trade and free silver coinage at the rate of 16 to 1; declared that "industry and commerce should be left free to pursue their method according to the natural laws of the world, but when the business aggregations known as trusts prove hurtful to the people they must be restrained by natural laws, and, if need be, abolished." It also favored the enactment of legislation which will regain for American ships the carrying of our foreign commerce.

Elections.—The State offices filled by the election on November 7 were governor, lieutenant-governor, treasurer, Supreme Court judge, superintendent of public instruction, and railroad commissioner. The Republicans had renominated for governor Leslie M. Shaw, who received 239,543 votes; the Democratic candidate, Fred E. White, received 183,326; the Populist candidate, Charles A. Lloyd, 1694; the Prohibitionist candidate, M. V. Atwood, 7650; the Social Labor candidate, M. K. Kremer, 763; and the United Christian candidate, C. C. Heacock, 483 votes. The total vote cast was 433,459, and Governor Shaw was elected by 56,217 plurality.

State Officers and National Representatives.—Governor, Leslie M. Shaw; lieutenant-governor, J. C. Milliman; secretary of state, George L. Dobson; treasurer, John A. Herriott; auditor, F. H. Merriam; attorney-general, Milton Remley; superintendent of public instruction, R. C. Barrett; adjutant-general, M. H. Beyers. Supreme Court: Chief justice, C. T. Granger; associate justices, Scott M. Ladd, G. S. Robinson, Josiah Given, C. M. Waterman, H. E. Deemer; clerk, C. T. Jones. The State legislature consists of 116 Republicans and 34 Democrats. Senators: William B. Allison, from Dubuque, and John H. Gear, from Burlington—both Republicans. Representatives: Thomas Hedge, from Burlington; Joseph R. Lane, from Davenport; D. B. Henderson, from Dubuque; Gilbert N. Haugen, from Northwood; Robert G. Cousins, from Tipton; John F. Lacey, from Oskaloosa; J. A. T. Hull, from Des Moines; William P. Hepburn, from Clarinda; Smith McPherson, from Red Oak; J. P. Dolliver, from Fort Dodge; and Lot Thomas, from Storm Lake—all Republicans.

IOWA, UNIVERSITY OF. See UNIVERSITIES AND COLLEGES; PSYCHOLOGY, EXPERIMENTAL.

IRELAND, an island forming part of the United Kingdom of Great Britain, has an area of 32,583 square miles, and a population, according to the census of 1891, of 4,704,750 (estimated, 1898, 4,541,903), divided among the four provinces of Leinster, Munster, Ulster, and Connaught. Since 1845 the population has decreased nearly one-half, owing to emigration.

Emigration.—Ninety-seven per cent. of the emigration has been to the United States. It was especially heavy from 1840 to 1850, the period of the potato famine. In recent times it has been decreasing gradually. The emigration to the United States in 1899, according to the annual report of the United States commissioner of immigration, amounted to 32,345. Of this number 1158 could neither read nor write, and 22,321 brought less than \$30 apiece. About 6000 had been in the United States before. Nearly 12,000 settled in New York, over 8500 in Massachusetts, 3370 in Pennsylvania, 1600 in New Jersey, over 1400 in Connecticut and Illinois, respectively, and over 900 in California.

Government.—The executive government of Ireland is vested in a lord lieutenant or viceroy, who is assisted by the chief secretary, the lord chancellor of Ireland, the attorney-general for Ireland, and a privy council, Irish affairs being under the general direction of the ministry in London. The chief secretary of Ireland, who is the secretary to the lord lieutenant, is responsible to the House of Commons for his administrative acts, and is assisted by a permanent under-secretary. Ireland is represented in the British House of Lords by 28 peers, and in the House of Commons by 103 members. The first elections under the new Irish Local Government act were held on January 16. See GREAT BRITAIN.

Religion and Education.—Seventy-five per cent. of the Irish are members of the Roman Catholic Church, 12 per cent. belong to the Church of England, and 9 per cent. are Presbyterians. At the head of the educational system of Ireland are the University of Dublin and the Queen's Colleges of Belfast, Cork, and Galway. There is a Catholic university, which includes the University of Dublin, and seven

Catholic colleges. The secondary and primary schools are mostly under the commissioners of national education.

Statistics for production and trade are included in those for the United Kingdom. See the article GREAT BRITAIN, which article also contains references to Irish affairs in its paragraphs on History.

IRON AND STEEL. The year of 1899 was unparalleled in the history of iron mining in the United States, and while accurate figures are not yet at hand, the production will, it can be positively stated, exceed that of 1898 by several million tons; it is estimated by some that the total production in 1899 will equal 25 million tons. It is highly satisfactory to see also that the American steel manufacturers were not only able to meet the native demand, but also that from abroad.

The *Engineering and Mining Journal* gives the following figures of pig-iron production for 1898 and 1899:

	1898.	1899.
Foundry and forge irons.....	3,487,337	4,189,415
Bessemer pig.....	7,337,364	8,219,799
Basic pig.....	785,444	1,010,618
Spiegel and ferro.....	213,769	229,661
Total.....	11,773,914	13,649,493

This shows an increase of 15.9 per cent.

The world's production of pig-iron has been :

Country.	Year.	Production in Tons.	Country.	Year.	Production in Tons.
United Kingdom.....	1898	8,631,151	Germany.....	1898	7,402,717
Austria.....	1897	897,945	Italy.....	1897	8,398
Hungary.....	1897	420,478	Japan.....	1898	16,000
Bosnia.....	1897	16,000	Russia.....	1898	2,223,000
Belgium.....	1898	979,101	Spain.....	1897	297,100
Canada.....	1898	68,755	Sweden.....	1897	538,197
France.....	1898	2,534,427	United States.....	1898	11,773,914

Owing to this increased activity in the iron-ore industry during 1899 there has been an extraordinary shipment of ore from the Lake Superior region, and the question is whether the high-grade ore bodies will be able to stand the drain upon their resources. It is prophesied that there will be a call in the future for the low-grade jaspery ore, of which there are boundless supplies still untouched, to mix with the high-grade Mesabi ore. This unusual demand for iron has led to the opening up of many mines in all parts of the United States that had been abandoned or shut down temporarily, and also to the starting up of a number of old blast-furnaces. W. B. Phillips, in a report of the iron making in Alabama, notes that Alabama ranks third as a producer of iron ore. Phosphorus is present in the Alabama ores to such an amount that they yield no iron of Bessemer grade, but the iron is successfully used for the manufacture of steel by the basic open-hearth process. J. F. Kemp points out that the titaniferous iron ores are extremely widespread, and that everywhere with two exceptions they occur in basic igneous rocks of the gabbro type. The iron ores of the Oriskany formation in Virginia usually contain some zinc, which forms a deposit on the furnace walls, and yields a valuable by-product.

Not only in the mining but in the manufacture of iron the year 1899 was one of unparalleled prosperity and productiveness in the United States. During the year the enormous production of over 25,000,000 tons of iron ore was consumed to keep the iron and steel mills of the country in operation. All but about 8,000,000 tons of this ore was drawn from the Lake Superior mining region. The total amount of pig-iron produced was 13,649,493 tons, which was an increase of about 16 per cent. over the tonnage produced in 1898. Estimates made by prominent authorities place the output of steel at 10,000,000 tons, of which about seven-tenths were manufactured by the Bessemer process. Despite the enormous production of iron and steel the demand exceeded the supply throughout the year, and prices rose steadily. At Pittsburg, Penn., Bessemer pig-iron started the year at the price of \$10.75, and by July it had risen to \$20, and it closed the year at \$25 per ton. Foundry irons kept pace with Bessemer, and there was a proportionate advance in other grades. Steel billets sold for \$16.25 in January, and for \$37 and \$40 during the last months of the year.

Nearly every form of manufactured iron and steel exhibits a similar advance, as the following table of prices for December of 1898 and 1899 will show:

	1898.	1899.		1898.	1899.
Bessemer.....	\$10.80	\$35.00	Billets.....	\$16.50	\$37.00
No. 1 Foundry.....	11.10	24.00	Billet ends.....	11.00	24.00
No. 2 Foundry.....	10.75	23.25	No. 1 scrap.....	12.00	24.00
Mill iron.....	10.65	21.50	Steel rails.....	17.50	37.00
White iron.....	9.25	20.00	Bar iron.....	1.18	2.15
Mottled iron.....	9.30	20.50	Iron nails.....	1.30	2.50
Silvery, No. 1.....	12.00	27.00	Steel nails.....	1.25	2.60
Charcoal, No. 1 Foundry.....	16.00	37.00	Wire nails.....	1.50	2.95
No. 2 Foundry.....	15.50	36.00	Coke at ovens.....	1.50	3.00
Cold blast.....	21.50	38.00	Ferromanganese, 80 per cent.....	50.00	100.00
Warm blast.....	15.25	27.00	Old iron rails.....	14.00	30.00
Muck bar.....	18.85	33.00	Old steel rails.....	10.00	23.00

The process of combination and consolidation in the iron trade which was so active in 1898 continued into 1899, and with them a new era may be said with considerable truth to have developed. A number of these combinations, like the Federal Steel Company, and the great Carnegie combination, already own or are acquiring the ore mines, coal mines, coke ovens, steamers, railways, mills, and every other facility which will make true their adopted motto of "from the mine to the consumer."

Activity in the iron and steel trade was not confined to the United States, but extended to all the industrial countries of Europe. In the first half of the year Great Britain produced 4,782,868 tons of pig-iron, and 2,587,241 tons of steel, and the estimates made for the second half of the year indicate a total output of 9,700,000 tons of pig-iron and 5,200,000 tons of steel for the year. In Germany the blast-furnaces reported for the ten months ending with October a total of 6,719,853 metric tons of pig-iron, an increase of 10 per cent. over 1898, and the total for the year is estimated at 8,165,000 tons, by far the largest quantity ever reported. In Belgium the estimated result of the year is a production of 1,015,000 tons of pig-iron, 501,500 tons of wrought iron, and 719,500 tons of steel. In France, Austria-Hungary, and Sweden and Russia substantial increases have been made. In its annual summary of the year's iron and steel production the *Engineering and Mining Journal* estimates "that the total production of pig-iron in the world in 1899 was in round figures 41,000,000 metric tons, an increase of 3,500,000 tons over 1898; while steel making showed even a greater proportionate increase, and amounted to 27,000,000 tons, an advance of nearly 3,000,000 tons over the preceding year."

One feature of this enormous activity in the iron trade has been to delay somewhat the progress in metallurgy and the general technology of steel and iron manufacture, and there have been no great changes made during 1899, although improvements which were under way have been on the whole substantially extended. These improvements have been largely in the line of the perfection of mechanical devices for handling the product and increasing the output. Most American steel is made by the acid process, but during the past year a large plant has been completed for the manufacture of Basic steel at Ensley, near Birmingham, Ala. Chalmot writes that ferro-silicon containing 11-13 per cent. of silicon has been made in blast-furnace and used in the manufacture of iron and steel, but the percentage of silicon can be increased only by recourse to the electric furnace. In this way alloys with as much as 46 per cent. of silicon are made. Ferro-silicon with 26 per cent. can be melted in a brass furnace; when 32 per cent. is reached a blast is required, and above that point the electric furnace is needed for fusion. Low-grade silicides cast well, but higher grades crack and form blowholes. Lantz, in *Stahl und Eisen*, gives some interesting comparisons bearing on the improvements which have taken place in rolling-mills. *Die Geschichte des Eisens*, L. Beck; *Handbuch der Eisenhüttenkunde*, A. Ledebur; *Journal of the Iron and Steel Institute*, LIV.

Blast-Furnaces.—The number of blast-furnaces in operation during the year reached its maximum in December. The last preceding full period in the number of furnaces in blast was in February, 1892. A comparison of the significant features of these two periods gives the following results:

	February, 1892.	December, 1899.
Number of furnaces in blast.....	308	283
Total weekly output, tons.....	187,383	296,959
Average weekly output, each, tons.....	608	1,050
Average daily output, each, tons.....	87	150

These figures illustrate a most significant feature which is now being manifested in blast-furnace practice—namely, the enormous increase in the size of the furnace being employed. During the last two years furnaces were built or placed under construction having a daily capacity of output of from 500 tons to 800 tons. The last and largest of these having a capacity of 800 tons of pig-iron daily was begun in December, 1899, by the American Steel and Wire Company. Some idea of what the construction of such a monster furnace means to the iron industry in labor and capital involved may be obtained from the following rough estimates: A single furnace of 400 tons capacity daily requires approximately 800 tons of ore every 24 hours. It takes in round numbers $1\frac{1}{4}$ tons of coke to make a ton of pig-iron, so that the furnace must be fed with 500 tons of fuel. In addition, about 200 tons of limestone are required for fluxing, and there are also minor supplies of sand, coal, etc. Finally there are the 400 tons of finished iron to be taken away every 24 hours. Summed all up, about 2000 tons of freight of all kinds—ores, fuel, lime, finished pig-iron, and other materials—have to be moved daily to keep the stack going, making about 70 car-loads of 30 tons each. Somewhere between 250 and 400 men will have to work to get out the ore, this depending upon its locality, richness in metallic iron, etc. To mine the coal and make it into coke, to quarry the limestone and do all the hauling, at least 500 men will be required, and the furnace itself will give work to 250 men at the very least. In other words, the running of a single blast-furnace turning out 400 tons of pig-iron daily means the employment of 1200 men and of \$2,000,000 capital. When it comes to the gigantic institution now planned by the American Steel and Wire Company to turn out 800 tons daily, it is impossible at this time even for the projectors themselves to give exact figures; but it is probable that not fewer than 2000 men will find employment by it, in one way and another, and that it and its ramifications will mean utilization of between three and four millions of capital.

Casting-Machines.—The building of these enormous furnaces has brought into increasing use casting-machines for making pig-iron, as a substitute for the time-honored practice of running the molten iron tapped from the furnace into hundreds of little channels cut in the bed of sand covering the casting-floor at the foot of the furnace, each channel being the mould for casting one "pig." The Uehling casting-machine is the one most extensively used in America, and in this arrangement the cast-iron is tapped from the blast-furnace directly into a large ladle which is carried by rail to the casting-machine. This consists essentially of a "Jacob's ladder" or common bucket elevator, of which the buckets and their supporting belt are replaced by a series of horizontal trough-shaped, open, cast-iron moulds, their ends supported and carried by the two parallel endless chains which form the skeleton of the elevator. This, in rising very gradually, carries these moulds successively under and past the lip of the ladle which contains the molten iron from the furnace. The ladle tips progressively and fills the passing moulds one after another. They pass on slowly up the elevator, so slowly that by the time any of them has reached the top of the elevator the pig-iron which it contains has become solid. When the mould passes the sheave at the top, the pig is dumped out upon another conveyor, which is horizontal and partly submerged in water. Arrangements are also provided for sprinkling the moulds with water on their return journey, and sometimes also while they are travelling full.

Gas Utilization.—One of the most important developments in blast-furnace practice has been the utilization of the gases, which are produced in enormous quantities and which were formerly wasted, to preheat the blast, to raise steam, to run gas engines, etc. Competent authorities estimate that over and above the power consumed to preheat the blast and raise steam for the blowing-engine, the waste gases from a blast-furnace will produce from 6 to 10 horse-power per ton of pig-iron output per week.

Steel.—In the ordinary process of steel manufacture the molten iron from the blast-furnace is first cast into pigs, and then these pigs have to be melted in the steel furnaces for making steel. Much study is now being given toward developing a commercially successful process by which the molten iron from the blast-furnace may be run directly into the steel converter, without the intermediate operation of casting and remelting. It seems likely that the next few years will record some notable developments in this direction. In the Bessemer process the year 1899 showed a further extension of the car-casting system; carborundum has also come into use as a substitute for ferro-silicon. (See CARBORUNDUM.) In open-hearth-furnace practice the tendency which attracts most notice is the increasing use of rotary furnaces or furnaces which, instead of being fixed and stationary like a blast-furnace, resemble more nearly a Bessemer converter in the respect that they are mounted so that they may be tipped up and down in a vertical direction to allow the molten metal to be emptied out. The Pennsylvania Steel Company, of Steelton,

Penn., and the new steel works at Ensley, Ala., both have large plants of rotary open-hearth furnaces in operation.

In rolling-mill operation and equipment there has been little to signalize the year. Where new equipment has been installed it has naturally been machinery of the latest pattern, such as the extension of the continuous mill to the rolling of merchant iron and small billets, and the growing use of continuous heating furnaces for ingots and billets. In armor-plate making the Knapp process has forged rapidly to the front, largely, if not entirely, displacing the Harvey process for war-vessel protection. A large and increasing use of armor-plate is in the construction of bank-vaults. One of the principal developments in the use of manganese steel has been in the same line or for safe construction. Nickel steel has gained ground during the year, more particularly for making propeller shafts, crank and thrust shafts, piston rods, connecting rods, and other engine forgings.

Foreign Trade.—In the cruder forms iron exports from the United States in 1899 were less than for 1898. There was a notable falling off in pig-iron and in steel rails, the comparative figures being: pig-iron, 1898, 249,377 tons; 1899, 228,640 tons; steel rails, 1898, 291,038 tons; 1899, 171,272 tons. There was, however, an increase in steel plates, wire and wire nails, and structural iron. The values for some of the most important classes of iron and steel exports for 1898 and 1899 respectively were: Metal working machinery, \$5,741,750, \$6,840,924; locomotives, \$5,190,782, \$4,767,850; pipes and fittings, \$4,595,451, \$6,763,396; locks, hinges, and builders' hardware, \$4,308,799, \$5,464,913; sewing machines, \$3,062,471, \$4,103,828; pumps and pumping machines, \$2,300,811, \$3,016,645. The total values of exports of iron and steel and various manufactures of the same have been reported as follows: 1897, \$62,737,250; 1898, \$82,771,550; 1899, \$105,689,645. These figures do not include railroad or street cars, bicycles or carriages, or agricultural implements; by far the largest item in this list, and one that shows a rapid increase, is mowers and reapers, which have been exported as follows: 1897, \$3,149,625; 1898, \$6,551,741; 1899, \$9,739,129. The magnitude of the iron and steel industry becomes more apparent in view of the fact that exports represent but a small part of the American product.

The import trade, which formerly overshadowed the exports, now takes secondary rank, although it has been on the increase. The total values of iron and steel imports, exclusive of ore, have been reported as follows: 1897, \$13,835,950; 1898, \$12,474,572; 1899, \$15,790,206.

IRON CLAY. See OCHRE.

IRRIGATION. The irrigable area of the arid region of the United States is estimated by the secretary of the interior in his last report as 74,000,000 acres, capable, he says, "of sustaining and comfortably supporting, under a proper system of irrigation, a population of at least 50,000,000." On some of the Indian reservations irrigation works have been provided by the United States government, with promising results. The United States secretary of agriculture devotes a part of his report to the alkali soils of the West, which often increase in troublesomeness with irrigation, especially where too much water is applied to the crops and there is poor drainage. Seepage or leakage of water from canals and other causes tending to keep the ground unduly wet increase the troubles from alkali. The serious problems of irrigation at present relate to the disposal of public lands and to water rights and their distribution. The United States Department of Agriculture is studying the question of water rights in the several States, and hopes to cover the whole arid West this year if sufficient money can be secured. The National Irrigation Congress, in session at Missoula, Mont., September 27, 1899, passed a series of resolutions, which may be summarized as follows: The lease of public grazing lands was recommended at a nominal rental and in limited areas to settlers on adjacent lands, the revenues so derived to go to the States and Territories concerned for use in irrigation development. The report of Colonel Hiram M. Chittenden, recommending the construction by the federal government of storage reservoirs to aid navigation and irrigation was endorsed, and the federal construction of irrigation works was favored "wherever necessary to furnish water for the reclamation and actual settlement of the arid public lands." United rather than divided ownership of land and water was approved, the enactment of harmonious irrigation laws by the several States urged, the establishment of a national commission to adjust differences regarding the appropriations of interstate waters favored, the preservation of forest lands urged in the interests of the lumber and water supplies, and opposition was expressed to "the cession of the public lands of the nation to the respective States and Territories, except upon conditions so strict that they will insure the settlement of such lands by actual settlers in small tracts and absolutely prevent their absorption in large bodies under private ownership."

The California Water and Forest Association was organized in 1899 to work for the storage of flood waters in that State in the interests of navigation and irrigation

and to prevent land and other damages by floods. The association intends to co-operate with the various government departments in the interests of irrigation and water conservation. Some of the irrigation works of Utah have adopted pipe lines, in place of open ditches, to convey water, as is commonly done in California and other sections where the importance of saving water otherwise lost by evaporation and seepage is realized. Experiments with vegetables at the agricultural experiment station, Logan, Utah, indicate that the best results may be obtained by applying water in furrows the first part of the season and by flooding the whole service later on. A company with headquarters near Lake Charles, La., is reported as having begun large irrigation works for rice culture, to cover 25,000 acres eventually. Several miles of canals and several pumping and repumping plants are proposed, capable of lifting 50,000 gallons per minute at the start and 180,000 gallons at a later period. (See DAMS.) The United States Geological Survey has issued a number of reports dealing with irrigation problems in different parts of the country. See GEOLOGICAL SURVEYS.

IRWIN, JOHN NICHOL, United States minister to Portugal, was appointed to this position on April 18, 1899, to succeed Mr. Lawrence Townsend, transferred to the embassy at Brussels. Mr. Irwin was born in Ohio in 1847; he attended the public schools in Keokuk, Ia., and for a time was a student in Miami University, Oxford, O. In 1864 he served as a private in the Forty-fifth Iowa Volunteers. Having entered Dartmouth, he was graduated there in 1867, and soon after engaged in business. He has been active in Western politics, and some years ago was elected mayor of Keokuk, receiving the support of both parties. In 1883 he was appointed governor of Idaho by President Arthur, and in 1890 governor of Arizona by President Harrison.

ISMAY, THOMAS HENRY, one of the leaders in the development of the commercial marine of Great Britain during the last quarter century, and the founder of the White Star Line steamship company, died in England, November 23, 1899. Mr. Ismay was born in 1837 in Maryport, Cumberland. After an apprenticeship with the shipping firm Imrie, Tomlinson and Company he entered the shipping business for himself. In 1866 he acquired the old White Star Line of wooden clippers to Australia; he substituted iron vessels, and founded the modern White Star Line of steamships. In the development of this company Mr. Ismay's fellow-apprentice, the son of his former master, Mr. Imrie, joined with him as junior partner to form the firm of Ismay, Imrie and Company. In 1885 Mr. Ismay built two vessels of the *Teutonic* type for government use as fast auxiliary cruisers in case of war.

ITALIAN LITERATURE. Although at first sight it would seem that Italy makes a very creditable showing for 1899 in the world of letters, yet a careful winnowing of the material reveals a somewhat scanty residue of volumes which are of really permanent and widespread interest. One cause of this may be sought in the unusual number of literary, historical, and artistic centenaries which have occurred within the past eighteen months. Amerigo Vespucci and Paolo Toscanelli, Savonarola, Leopardi, Moretto of Brescia, Bernini, and Giuseppe Parini have all been celebrated within that period, and each in turn has involved a shower of speeches, biographical writings, and critical studies of varying degrees of merit, but which taken as a whole may be summed up as more erudite than entertaining. A second explanation is to be found in the fact that among the writers who admittedly stand highest in contemporary literature few have even a single volume to their credit. This is especially true in the department of fiction, for while D'Annunzio, Verga, and Fogazzaro have each a new novel ready, the publication has been deferred until 1900.

History.—Among contemporary Italian historians there are probably few who are more illustrious, each in his own way, than Pasquale Villari, Ettore Pais and Isodoro del Lungo; and each of these has done important work during the past year. Professor Pais contributes the second part of his valuable *History of Rome*, which has already attracted much attention, and in which he applies still more radically than Mommsen the latter's destructive criticism of early myths, but goes a step farther than Mommsen by attempting to use these myths for the purpose of reconstructing the early history of Rome. Professor Villari's new work, which is not yet completed, also deals with the early history of Italy, and is to be entitled *Barbaric Invasions of Italy*. A work of interest to the student of the middle ages is a comprehensive *History of the Italian Marine*, by Camillo Manfroni, instructor in the Naval Academy at Leghorn, who covers the period from the incursions of barbaric tribes at the close of the fourth century down to 1261, the year in which Genoa formed an alliance with Michael Paleologus. Del Lungo is best known for his important studies on the history of Florence and for his contributions to Dante literature. In his new volume, *From Boniface VIII. to Henry VII.*, he traces the

fortunes of the Florentine democracy at the close of the thirteenth century and the beginning of the fourteenth—the period of Dante's life—in its relations to emperor and church, under the sway of the two great champions of Guelphs and Ghibellines, respectively. Of late years the number of works dealing with the war for Italian independence and the period of national regeneration which followed has steadily increased. Probably the most important of recent works of this class is Domenico Zanichelli's *Studies of the Political and Constitutional History of the Regeneration of Italy*. The author, who is professor of law in the University of Sienna, takes the ground that the unification of Italy and the establishment of a representative form of government are not the fruit of a spontaneous movement on the part of the people, but rather the effect of a slow and persistent effort on the part of their best thinkers and philosophers, statesmen, and poets. In this same category belongs the work of that veteran journalist and patriot, Luigi Chiala, *Giacomo Dina and His Part in the Vicissitudes of the Regeneration of Italy*, the first part of which appeared in 1897. The second volume covers the period from 1861 to 1866—that is, from the death of Cavour to the eve of the outbreak of the war for Venice. This is far more than a biography, and could justly have been called a history of the moderate liberal party. A third work of importance in relation to the history of this period is the posthumous volume by Marco Minghetti, *The Convention of September, 1864*. This volume, which Minghetti was unwilling to have published during his life, or until every doubt as to the political prudence of doing so was set at rest, was written not so much to justify as to explain his motives when as president of the council of ministers he concluded with France the famous convention of September. *Recollections and Impressions of Our Political History During 1866-67*, by Giuseppe Gadda, is also valuable. In conclusion, two volumes dealing with the history of the Italian possessions in Africa deserve mention: *From Adua to Addis-Abeba*, by Nicola d'Amato, being the record of the author's imprisonment during the war with Menelik, and *The Colony of Eritrea from Its Origin until March 1, 1899*, by Lieutenant B. Melli, who divides his work into three parts, the first ending when General Baratieri assumed authority, the second closing with the battle of Adua.

Critical and Biographical Studies.—Each year brings forth a goodly crop of minor studies and monographs upon the recognized Italian classics. Of those upon Dante, many find a permanent home either in the *Biblioteca Critica della Letteratura Italiana*, under the direction of Francesco Torraca, or in the recently established *Biblioteca Storico-Critica della Letteratura Dantesca*, under that of C. L. Passerini and P. Papa. The latest additions to the latter series are *The Historic Personality of Folchetto di Marsiglia in the Commedia of Dante*, by Nicolo Zingarelli, and *The Subjectivism of Dante*, by Egidio Gorra. A really excellent volume is a collection of studies by Isidoro del Lungo, entitled *Dal Secolo e dal Poema di Dante*. In view of Giuseppe Parini's recent centenary, special interest attaches to the edition of his selected poems, edited and annotated for the occasion by Professor Michele Scherillo. The latter also contributed to the August number of the *Nuova Antologia* an interesting study of Parini, in which he reminds us that Manzoni considered Parini's odes not only the best which Italian literature possessed, but also the finest which were ever written. The flood of monographs upon Leopardi abated somewhat in 1899; at the same time the long-promised *Pensieri Inediti di G. Leopardi* were being edited by a government commission from manuscripts formerly in possession of Antonio Ranieri, but claimed by the government on grounds of public utility. There are to be ten volumes of these *Pensieri*, of which four are already issued; they are of great psychological interest and will be indispensable to any one who wishes to make an exhaustive study of the poet of Recanati. An interesting evidence of the growing influence of France upon Italian literature is the increasing tendency among Italian critics to collect their essays, scattered in periodic literature, and republish them in volumes. Such a volume is the one upon Manzoni recently issued by Policarpo Petrocchi, who has written many articles on the author of *I Promessi Sposi*, and now gathers them together for the first time. Other interesting collections of essays are: *Letteratura d'Eccezione*, by Vittorio Pica, including studies of Paul Verlaine, Stéphane Mallarmé, Maurice Barrès, Anatole France, and Huysmans; *Studi Letterari*, by Giulio Pisa, which range from Leonardo da Vinci to Walt Whitman; *Conversazioni Letterarie*, by Professor G. A. Cesareo, and a third series of *Cronache Letterarie*, by the veteran Sicilian novelist and critic, Luigi Capuana. Finally, there is a curious and suggestive little volume by a young critic, Fausto Squillace, who by combining literary criticism with the methods of Nordau seeks to determine *The Present Tendencies of Italian Literature*. For this purpose he limits his researches to the novelists, whom he divides up into three groups—realists, mystics, and egotists; and the three writers whom he takes as the respective types of these three classes are Giovanni Verga, Antonio Fogazzaro, and Gabriele d'Annunzio.

Fiction.—Unfortunately, these three novelists, who stand to-day in the front ranks of Italian letters, published no novels during 1899, although Verga's *Duchessa di Leyra*, Fogazzaro's *Piccolo Mondo Moderno*, and D'Annunzio's *Fuoco* were announced for early issue. Meanwhile, Verga's earliest and almost forgotten story, *Una Peccatrice*, has been republished in a new and attractive series of writings by the best authors; *I Semprevivi*, issued by Sig. Gianotta, of Catania, who has also gathered together in the same series some fugitive pieces by Fogazzaro and published them under the title *Sonatine Bissarre*. To the *Semprevivi* also belongs the latest novel of Matilde Serao, the talented Neapolitan authoress, who has sometimes rather inaptly been called the George Sand of Italy. *La Ballerina* is a sombre and thoroughly realistic study of the life of a Neapolitan ballet dancer, and leads relentlessly and with unerring touch to the final and inevitable tragedy. The same author has to her credit a volume of travels in the Holy Land, entitled *Nel Paese di Gesù*, and is now putting the finishing touches to a new novel, *Dopo il Perdono*. Edmondo de Amicis, who is probably the most widely known of any living Italian writer outside of his own country, seems to have retired definitely from the ranks of novelists. Instead, he gives us this year a volume of *Memorie*, including many interesting souvenirs of his travels and of the many famous people he has known, Dumas among others. Girolamo Rovetta, whose success as a romancer rests mainly upon *La Baraonda*, has just completed *La Signorina*, a story of fashionable Milanese life, which is appearing serially in the *Nuova Antologia*, and, judged from the initial chapters, promises to be of interest. Other novels which deserve mention are: *La Roma che se ne va*, by Senator F. Nobili Vitelleschi, which gives a vivid picture of Roman society prior to 1870, and especially of the struggle then going on between church and state; *Clara Albiati*, an unpleasant study of morbid passion, by E. A. Marescotti, interesting only because it depicts in somewhat exaggerated colors the Milanese riots of 1898; *Raggio di Dio*, by A. G. Barrili, a highly romantic novel, based upon the supposed adventures of Columbus during one of his voyages to America, and *Natalia*, by Enrico Castelnovo. Among the women writers of Italy there is none who gives more brilliant promise than the Sardinian novelist, Grazia Deledda. Her scenes are all laid in her native island, and her characters are taken from the peasantry. Yet with these simple materials she obtains remarkably effective results, and her Millais-like landscapes and Rembrandtesque portraits are not easily forgotten. She is a prolific writer, her volumes for the past year including two novels—*La Giustizia* and *Il Vecchio della Montagna*, and a book of short sketches, *Le Tentazioni*.

Drama.—It is curious to note how strong a fascination the stage exerts upon the great majority of Italian men of letters; sooner or later they yield to it. Even such a veteran as Salvatore Farina has this year (1899) succumbed to the temptation, and tried the theatre with his first comedy, *Tutto per il Mondo*. E. A. Butti, whose last novel, *Incantesimo*, proclaimed him a disciple of D'Annunzio, has tried his hand at a drama, *La Fine di un Ideale*; and Federico de Roberto, the youngest member of the Sicilian school of realists, has cast his latest short sketch, *Il Rosario*, in dramatic form. But of course the most important events of the year in Italian drama are the production of D'Annunzio's *Gloria* and *La Gioconda*. The first of these did not bear the test of the stage, and therefore may be dismissed, since the question whether it may please when read is scarcely to the purpose. *La Gioconda*, however, held its audience, and is unquestionably a work of real dramatic power, although some features would hardly be found tolerable by an Anglo-Saxon audience. The reproach of immorality which has been made against the subject of the play is certainly unfounded, for while the plot turns upon the story of an illicit love, the development of the theme is obviously inspired by a high moral purpose. Briefly stated, the motive of the play is furnished by the infidelity of a young artist, Lucio Settala, weakly vacillating between his affection for his wife Silvia and his passion for his model, "La Gioconda;" and the crisis of the play is the verbal duel between the two women in the studio scene, culminating in the overturning of the statue, Settala's masterpiece, and the crushing of Silvia's hands in an attempt to save it. It is this incident, resulting in the amputation of the heroine's hands, which would probably be found intolerable to an American audience; and yet the pathetic figure of Silvia, deprived of her hands and wounded alike in heart and body, is presented to us with an antique pathos and a spirit of lofty poetry which are unfortunately rare in contemporary drama.

ITALY, THE KINGDOM OF, is contained chiefly on the middle one of the three peninsulas which project from the southern coast of the continent of Europe. It includes also the large islands of Sicily and Sardinia, the island of Elba, and about 66 minor islands. The total area is 110,623 square miles, and the population (December 31, 1897), 31,479,217, including a large settled and floating population of Americans and English. The principal towns are Naples, 536,073 (1897); Rome, 487,066; Milan,

470,558; Turin, 351,855; Palermo, 287,972; Genoa, 228,862; Florence, 209,540; and Venice, Bologna, Messina, Catania, and Leghorn.

Production.—Agriculture is the principal occupation. Wine, fruit, olives, and olive oil are largely produced, and the silk industry is important. The principal grain crops are wheat and maize. Tobacco is also grown. About 71 per cent. of the land is classed as productive. Three systems of land tenure hold: (1) Peasant proprietorships; (2) a form of partnership, including no wages, but a division of profits and losses; (3) the system of rent. Among the principal minerals of Italy are iron, lead, zinc, copper, manganese and antimony ores, sulphur, gypsum, amianthus, alum, and boracic acid, and there is some silver and gold. Salt is a government monopoly. About one-half the total annual mineral output is raw sulphur.

Commerce.—The total exports of Italy for 1898 are given from British statistics as £54,042,833, and the total imports, £61,786,723. The latter, consisting of cotton, wheat, coal, raw silk and cocoons, hides, timber, machinery, wool, fish, live stock, sugar, yarn, tobacco, etc., comes chiefly from Great Britain, Germany, France, Austria-Hungary, Russia, the United States, and Canada. According to a report of the Italian minister of finance, foreign trade during the first half of 1899 tells a story of prosperity. During this period the imports fell off from 741,000,000 lire (\$143,013,000) to 718,000,000 lire (\$138,574,000), a drop of 23,000,000 lire (\$4,439,000). But this was due to the importation of 111,000,000 lire less grain than during the same period of 1898, owing to the excellence of the last harvest. The importation of raw materials for manufacturing increased 71,000,000 lire. The exports for the first half of 1899 were 624,000,000 lire (\$120,432,000), a gain of 51,000,000 lire (\$9,843,000) over the same period of 1898. One of Italy's best customers is Germany, and efforts are being made to increase Italian shipments there, as well as to increase foreign commerce elsewhere, one field being Egypt.

Army and Navy.—The army organization is made up of a permanent force, a mobile militia, and a territorial militia. The army in June, 1898, had a strength of 3,221,726 men, of whom 310,602 were with the colors. Of the men on "unlimited leave," 503,875 were of the permanent army, 465,349 of the mobile militia, and 1,941,918 of the territorial army. The Italian navy, according to the classification adopted in this book for the other European fleets, consisted, as reported in June, 1898, of 15 battleships, and 2 building; 3 armored cruisers, and 2 building; 15 protected cruisers, and 3 building; 1 unprotected cruiser; 15 torpedo vessels; 1 torpedo boat destroyer in course of construction; 142 torpedo boats, and 2 building, and two ships for special purposes. Under this classification Italy had no coast defence ships. Lately the construction of new ships has had to be very much restricted, owing to lack of funds. In 1898 provision was made for the creation of an auxiliary fleet of merchant steamers. In 1899, 15 large and 11 small vessels were building, with a tonnage of 120,540. There were launched 2 battleships, 2 gunboats, 1 torpedo-boat destroyer, and 1 torpedo-boat.

Finance.—The budget estimates for the year 1898-99 showed a total revenue of 1,666,791,355 lire, and an expenditure of 1,686,793,409, leaving a surplus of 9,997,946. The revenue is derived mainly from income, land, and house taxes, of which the first is the most important. Also the customs and the state monopolies of salt and tobacco. The public debt on July 1, 1897, was 12,294,182,508 lire.

Religion and Education.—Roman Catholicism is the dominant religion, the Pope residing at Rome. (See ROMAN CATHOLIC CHURCH.) The Protestants and Jews make up a small part of the population. The state regulates public instruction, and maintains schools of every grade, on which a large amount is annually expended. In most parts of the country school attendance is compulsory between the ages of nine and twelve years, but it is said that the law is not strictly enforced. There are 21 universities, and, in 1899, about 50,000 secondary schools, with an attendance of about 2,550,000.

Colonies, Emigration.—Italy's foreign possessions are insignificant, including Eritrea and the Somaliland protectorate, in northeastern Africa. See the articles on those countries, and also AFRICA (paragraph on Italian Possessions.) Emigration is large, averaging nearly 300,000 annually. From 50,000 to 60,000 come directly to the United States from Italy, and many more by way of other European countries. In 1898-99 the number leaving Italy for the United States was 77,419, an increase of 18,806 over the previous year.

HISTORY.

Foreign Affairs.—Italy's foreign policy became the subject of much discussion early in the year through the announcement that the Chinese government had ceded to her the lease of the harbor of San-Mun in the province of Che-Kiang. The Italian minister at Peking, Signor di Martino, blundered in the negotiations, and complicated the situation by addressing what was practically an ultimatum to the Chinese government. He was recalled in the midst of his negotiations, and in his absence the

mission was intrusted to the British minister, Sir Claude Macdonald. The Italian government counted upon English support for its demands, but this support was not given, and the Chinese government, having shown itself sternly opposed, and having even threatened to resist by force the landing of Italian soldiers on the coast, the Italian squadron which had been sent to occupy the bay of San-Mun was forced to abandon the enterprise. The plan was not popular in Italy, and this check seemed to the Italian people a needless humiliation. Another point in which the foreign policy of the Italian government seemed to Italians lamentably weak was in connection with the hinterland of Tripoli. This region was involved in the Anglo-French convention of March 21, 1899 (see FRANCE, paragraphs on History), by which France acquired a portion of the hinterland. Certain classes in Italy had long cherished the hope that this part of the Ottoman Empire would belong to their country. The chief ground of anxiety was that France would gain control of the trade routes through the hinterland of Tripoli to Central Africa, but later it was reported to the chamber that France and England had given assurance that they had no designs on Tripoli, and that France had asserted that she had no intention of interfering with the lines of trade to Central Africa. On April 14 a French squadron visited Italian waters and saluted the Italian sovereign. A great deal was made of this in the press as a sign of a Franco-Italian *rapprochement*. Similar courtesies were extended to the Italians by an English squadron at the same time. An announcement of the new ministry's policy in the matter of foreign affairs was made by Signor Visconti-Venosta on December 12, 1899. He declared that the basis of Italy's foreign policy would continue to be the triple alliance, and that efforts would be made to maintain the friendly relations between France and Italy. As to the acquisition of Chinese territory, he announced that this policy had been definitively abandoned, and that henceforth the government would confine itself to developing commercial and industrial enterprises in China.

Social Defence Measures.—The Pelloux ministry came into power after the riots of May, 1898. These outbreaks necessitated the adoption of some severe measures of repression, and the Pelloux cabinet was formed with this purpose in view. A number of acts for public security were voted by parliament in order to supply the ministry with the means of suppressing the popular agitation. These special enactments, which were to endure only for a year, imposed certain restraints upon the press and upon the right of association and public meeting, and enabled the government to meet the danger of a strike in the public works. It was understood that before the end of the year the government would propose definite measures of a permanent character to take their place. These measures came up for discussion in the Italian chamber in February, 1899. They were concerned with the following subjects: (1) the right of public meeting; (2) the right of association; (3) the protection of the public service; (4) the press; (5) recidivists. Now that the revolutionary crisis had passed, the adoption of such stringent measures on a permanent basis seemed to many members unnecessary and oppressive, and there was a violent opposition to them from the first.

The Ministerial Crisis.—The overthrow of the Pelloux ministry was ostensibly occasioned by its failure in the department of foreign affairs. The government was blamed for not having prevented the arrangement between France and England which threatened the ultimate success of Italy's designs on Tripoli. Still sharper criticism was occasioned by the government's Chinese policy. The cabinet was accused of disrespect toward parliament in not referring to it so important a question as Italy's policy in China. Matters were not improved by General Pelloux's attempt to justify this action by pointing out the impossibility of leaving a matter of this sort to the hazards of parliamentary debate. This was construed as denying the parliamentary right of deciding upon a matter of external policy, and as implying that parliament was unable to understand what the honor and dignity of the country required. The ministry resigned May 2, 1899, in consequence of this adverse criticism, and in order to prevent the chamber from discussing the Chinese affair. Many believed that the real ground of opposition behind this matter of foreign policy was the hostility to the government measures of social defence.

The Reorganized Ministry.—General Pelloux was charged with the formation of a new ministry. As finally constituted, it showed an effort to conciliate the groups of the Centre and Right, especially those represented by Signor Sonnino, Signor Di Rudini, and Signor Visconti-Venosta. Its members were as follows: General Pelloux, prime minister and minister of the interior; Visconti-Venosta, foreign affairs; Bonasi, justice; Carmine, finance; Boselli, the treasury; General Mirri, war; Admiral Bettolo, marine; Baccelli, public instruction; Lacava, public works; Salandra, agriculture; San Giuliano, posts and telegraphs. It announced its policy on May 25, and the programme in regard to China showed a complete change. When General Pelloux at first addressed the chamber on this subject he said that he could not admit the right of the chamber to discuss the question of Italy's participation in the

division of China. Now the ministry promised to proceed very prudently in China, and, in resuming the negotiations, to take care not to commit itself or to take any important action without consulting parliament. It then entered upon the matter of social defence. There was much opposition to these measures for public security, but, an opportunity arising to test the sentiment of the chamber, it was found that there were 199 for the ministry's proposals and 118 against them. The debate which occurred in June occasioned several disorderly scenes in parliament. Members of the Left held that the renewal of such exceptional measures as were required by the revolutionary outbreaks was no longer necessary. The government replied that the existing state of affairs was due solely to this legislation, and that if it were not renewed the old disorders would break out again. The term of this provisional legislation was to expire on June 30, 1899. A vote taken on June 1 showed a strong majority for the ministry, but the obstructive tactics of the extreme Left prevented legislative action, and led to scandalous scenes in the chamber. Finally, the government had recourse to the extreme measure of putting the law in force by royal decree. On June 22 the king signed the decree, and the law was to operate from July 20. This is under the constitutional provision that when parliament cannot vote a measure it may be put into force by decrees, but the decree itself could not go into effect until it had received the approval of parliament. When the discussion of the decree came up in the chamber there were still more riotous scenes and some of the members came to blows. On June 20 the session was closed by a royal decree. Thus the law went into effect without having received the consent of the chamber, and the opposition had the chance of accusing the government of a violation of the constitution. The ministry, however, had virtually secured the approval of the chamber to the project, and it was only the obstructive tactics of the minority that prevented this approval from being formally expressed. The chief points in the measures for social defence were as follows: The police may prevent any public meeting when the safety of the community demands it. The displaying publicly of seditious emblems or flags was punishable by fine or imprisonment. Not only criminal associations, but all associations that tend to endanger social institutions, or the constitution of the state, may be dissolved by the minister of the interior. Attempts among the employees in the public works to organize a strike are punishable by fine or imprisonment. The press laws are extended to the publisher and to other persons taking part in the criminal publication.

IVES, WILLIAM BULLOCK, member for Sherbrooke of the Canadian House of Commons since 1878, died at Ottawa, Ontario, July 15, 1899. He was born at Compton, Quebec, November 17, 1841; studied law, and was admitted to practice in 1857, becoming a Queen's counsel in 1880. He was made president of the council in the cabinet of Sir John Thompson in 1892, and was minister of trade and commerce in the cabinet of Sir Mackenzie Bowell in 1894-95, and in that of Sir Charles Tupper in 1896.

JAMAICA, an island lying 90 miles south of Cuba and 100 miles west of Haiti, comprises, with the Turks and Caicos Islands, Morant Cays, Pedro Cays, and Cayman Islands, a British crown colony. The capital is Kingston.

Area and Population.—The area of Jamaica is 4200 square miles, and of the other islands politically attached 224 square miles. Jamaica's population in 1891 was 639,491, and in 1897 (estimated) 706,394; in the former year the inhabitants were classified as follows: Black, 488,624; mulatto or half-breed, 121,955; white, 14,692; East Indian, 10,116; Chinese, 481; unclassified, 3623. In 1896 the East Indian population amounted to 14,118. The populations of the principal towns are reported to be as follows: Kingston, 46,542; Spanish Town, 5019; Montego Bay, 4803; Savanna-la-Mar, 2952; Falmouth, 2517.

Religion and Education.—There is no state church. Statistics of the leading denominations in the island in 1897 were: Anglican, 41,872; Baptist, 35,033; Methodist, 24,429; Presbyterian, 11,370; Roman Catholic, 9300; Church of Scotland, 2400. For the year 1897-98 there were enrolled 98,205 pupils in the 913 government schools, and the average attendance was about 60,000. Besides the government schools there are several high schools and industrial schools, and two government institutions for the training of teachers.

Government, etc.—The colony is administered by a governor, appointed by the crown, together with a privy council and a legislature, the members of which are in part elected and in part appointed. The governor since February, 1898, has been Sir Augustus W. L. Hemming, who was previously governor of British Guiana. Local parish affairs are administered by elective boards. Besides a resident magistrate in each of the parishes there are circuit courts and a high court of justice. At the beginning of 1898, besides a militia, numbering 392, there were in Jamaica 1790 officers and men of the British army. The public debt in 1898 was £1,994,184. Appropriations were made to Jamaica in 1899 by the imperial government, under the Colonial

Loans Act, of £150,000 for the deficit in the general revenue account, £110,000 for railway completion, £88,000 for interest on railway debentures, £65,000 for public works, and £40,000 for water works—total, £453,000. Statistics of finance and commerce have been for fiscal years:

	Revenue.	Expenditure.	Imports.	Exports.
1896.....	£754,086	£807,975	£1,856,378	£1,470,241
1897.....	677,064	766,534	1,660,667	1,448,443
1898.....	672,535	796,749	1,814,793	1,662,543

Industries, Commerce, etc.—The principal industries are agricultural and pastoral; in 1897 the total number of acres under pasturage was 498,916, and under tillage 164,644. The number of acres given to the principal crops was as follows: Ground provisions, 80,656; sugar, 28,764; coffee, 22,387; bananas, 19,760; cocoanuts, 10,799. Statistics of imports and exports are given at the end of preceding paragraph. In 1897 the leading exports were as follows: Coffee, £165,494; sugar, £120,959; rum, £92,053; and the imports: cotton goods, £208,318; flour, £162,378; fish, £116,240; rice, £40,432. In 1897 the total tonnage entered and cleared in the foreign trade at the ports of the island was 1,560,944, and the Jamaica merchant marine comprised 125 vessels (all but one being sail) of 7153 tons. The railway lines aggregate 185 miles, the telegraph 937, and the telephone 831.

The only industry of importance in the Turks and Caicos Islands is salt raking, the annual product being about 2,000,000 bushels; from the Cayman Islands are exported cocoanuts and turtle grass.

A Political Crisis.—The increasing indebtedness of Jamaica, which by the end of March it was thought would be £172,000, caused the government of Sir Augustus Hemming to attempt a policy of retrenchment in the early part of 1899. The measures proposed included the discharge of district physicians receiving state pay, the closing of several public hospitals, and a reduction of salaries among minor officials, while to increase the revenue a tariff law, levying taxes, among other things, on industrial implements and literature, and promising to yield a permanent annual revenue of £350,000, was projected. These measures were opposed by the influential classes, and the tariff bill met with such bitter resentment from the people that in March a political crisis resulted. The legislature, refusing on the 15th of the month to pass the bill, was prorogued on the 21st by the governor; he, however, reconvened it on the day following, but increased the popular discontent by adding to the legislature four members, appointed by himself, who would give a majority for the tariff bill. So intense was the disapproval of this coercive measure that the governor attempted to effect a compromise, but the legislature would accept no terms without his relinquishment of coercion. The house then adjourned until April 4, while the governor conferred with the colonial secretary, Mr. Joseph Chamberlain; the result was a refusal of compromise on the part of the administration, and on April 5 the passage of the tariff bill was forced. Two days later the elected members of the legislature passed a vote of censure on the administration, and demanded the removal from office of the executive officials, including the governor. At this time the popular indignation against the administration was very strong. So critical was the situation that the governor yielded, and on April 11 withdrew the four additional members and appealed to the legislature for assistance in the fiscal troubles; thereupon the vote of censure was withdrawn, and an appropriation to meet immediate liabilities was made. On the 18th of May a new tariff bill was passed. This law being unfavorable to United States commerce called forth a protest from the American consul, who stated that in 1898 the United States had made proposals of reciprocity, and that these had been declined by the colonial secretary; for a 50 per cent. reduction of the tariffs on imports from the United States the latter country had offered a large tariff reduction on Jamaica oranges and sugar, and the free admission of all other products of the island. It was feared that the bill of May 18 would cause retaliatory measures on the part of the United States, and accordingly arrangements were made for a reciprocal treaty, which was concluded on July 1. This treaty provided for certain reductions of import duties on American goods and for a tariff reduction of 12½ per cent. on the sugar and 20 per cent. on the oranges and other fruits of Jamaica.

In order to secure necessary revenue the British colonial secretary, in September, 1899, ordered the imposition of an income tax and an increase in the land tax and in stamp duties; he said also that in the future the finances of the colony would be controlled by the colonial office. This will probably obviate such friction as occurred over financial matters in the spring.

JAMES, CHARLES P., sometime associate justice of the Supreme Court of the District of Columbia, died at his home in Leesburg, Va., August 9, 1899. He was born

in Cincinnati, May 11, 1818. He studied law, was admitted to the bar, and from 1850 to 1856 was a professor in the law department of Cincinnati College. Subsequently he was judge of the Superior Court in Cincinnati. In 1864 he moved to Washington, and for four years was professor of law in Georgetown University; he was a member of the commission appointed to revise the statutes of the United States. In 1879 he was appointed to the supreme bench of the District of Columbia.

JAPAN, THE EMPIRE OF, consists of four large and many small islands, numbering altogether over 4000, the estimated area of which is 148,456 square miles. The four principal islands have an area of 147,655 square miles, with a population on December 31, 1897, of 43,228,863. The foreign population in Japan on January 1, 1898, was 10,531, of whom 5206 were Chinese, 2118 English, and 1076 Americans. Japanese residents of foreign countries on December 31, 1897, numbered 58,785. The largest island is commonly known as Hondo, or Honshin (mainland). The other principal islands are the Chii-Shuna (Kurile) Islands; Yezo (Hokaido); Kinshin (the nine provinces); Shi-Koku (the four provinces); Liu-Kiu (Loo Choo); the Ogasawara (Bonin) Islands; the Goto, Oki, and Iki groups, and the islands of Sado, Tsushima, and Awaji. In 1895 Japan acquired from China the island of Formosa (area, 13,541 square miles), population, December 31, 1897, of 2,728,817, and the Pescadores Islands (area, 49 square miles; population about 44,820). The chain of islands stretches from Kamchatka in Siberia almost to the Philippine group. The largest city is Tokio, population, 1,300,000; Yokohama, the capital, has about 180,000 inhabitants. The system is of volcanic origin, and there are a number of active volcanoes.

Production and Industry.—Japan is coming to occupy in the Orient the position occupied by Great Britain in Europe—that is to say, confined as she is to an insular position, Japan will in time find herself unable to produce sufficient foodstuffs for home consumption, necessitating large foreign imports, while, on the other hand, many believe that she will in time become a great manufacturing centre for the East. Although the latter event may be postponed for a long time, there has been a wonderful industrial development within the past few years. Agriculture is at present the chief occupation, and rice is the chief product. Great care is bestowed on agriculture, and there is a well-planned system of irrigation. Besides rice, there are grown tea, cotton, tobacco, wheat, barley, oats, sugar-cane, vegetable wax, indigo, maize, buckwheat, millet, potatoes, turnips, beans, and peas. The persimmon is the fruit most successfully cultivated. Most of the other fruits, it is said, are not very palatable. The estimates as to the rice crop of 1899 place the amount at 214,649,424 bushels, a decrease of 11.7 per cent. from the production of 1898, and an increase of 6.5 per cent. over the production of ordinary years. As to her industries, Japan has silk and cotton mills and manufactories of matches, paper, glass, japanned ware, porcelain, and bronze ware. Her production of the latter three articles, together with silk goods, has long been famous. Copper, iron, and sulphur abound, and the sea fisheries are important. See, further, AGRICULTURE (paragraph Experiment Stations).

Commerce.—The foreign commerce of Japan for 1898 was as follows: Exports, 165,753,752 yen; imports, 277,502,156 yen. The most important recent events in the history of Japan are the substitution of the gold standard for the silver standard in 1896; the substitution of a moderately protective tariff for the former tariff, which imposed a uniform rate of about 5 per cent. *ad valorem*, and the abolition of extra-territoriality. The new protective tariff, the duties of which range from 5 to 40 per cent., went into effect on January 1, 1899, and the abolition of extra-territoriality, by which some 5000 foreign residents in Japan were placed under the jurisdiction of the native courts, instead of the consular courts, as formerly, also went into effect in that year. It is too early to ascertain the influence of these two changes upon the commerce of Japan. As to the first, the substitution of the gold standard, it has often been stated with confidence that its effect upon the import and export trades has been in every way beneficial. It was not expected that the moderately protective tariff would have much effect in checking importation at the present stage of manufacturing industries in Japan, but it was estimated that during the first seven months of 1899 imports declined 37 per cent. The apprehensions shown in some quarters in regard to the abolition of extra-territoriality, as likely to interfere with foreign commerce, are not shared by some observers who seem to have an expert knowledge of the actual conditions. The latter urge that this change is not likely to render the position of the foreign trader untenable in Japan, since such a result would be against the interests of the Japanese themselves. For even if the Japanese merchants should acquire a large part of the foreign trade, it would not necessarily reduce the demand for foreign merchandise. During the last ten years the proportion of foreign goods imported by Japan's merchants has rapidly increased, rising from 15.6 per cent. in 1887 to 36.4 per cent. in 1897, and this does not seem to have prevented a very rapid expansion of the

foreign trade. Whatever may be the ultimate effect of these changes, it is certain that down to the present time the foreign commerce of Japan has advanced with remarkable rapidity, and that to-day Japan is of great importance as an importing and consuming country. It remains to discuss the condition of the trade of the United States with Japan, and in so doing we make use of the statistics and comments published by the chief of the United States Bureau of Statistics.

Trade of the United States with Japan.—The subject of our trade with Japan assumed especial importance in 1899 in connection with speculations as to the probable results of the tariff and the judicial changes above mentioned. The importance of Japan as a market for the products of the United States has greatly increased. In 1881 Japan imported from the United States goods to the value of 31,128,125 yen, and in 1898 the value of imports from this country had risen to 277,270,228 yen. While in 1881 the United States supplied 5.72 per cent. of the imports, she supplied 14.57 per cent. of them in 1898, far outstripping her chief rival, Great Britain, whose products, though increasing absolutely, made up a much smaller proportion of the total imports in 1898 than in 1881. As to the imports to the United States from Japan, they have formed an exception to the usual rule in that they have steadily increased, rising from \$14,217,600 in 1881 to \$26,716,493 in 1899, while our total imports from the world at large have increased but slightly, and during the last few years have actually decreased. The steady increase of our imports from Japan is due to the fact that it includes materials used in some of our rapidly expanding industries, as, for example, raw silk and articles which cannot be produced at home, like tea and camphor gum. The latter class of articles is likely to increase with an increasing population. The chief article which Japan imports from the United States is raw cotton, the importation of which has greatly increased in the last few years, owing to the development of the cotton spinning industry in Japan. It is a staple whose consumption in Japan seems likely to continue increasing, in spite of the competition of British India and China. These latter countries, with their cheaper labor and lower cost of transportation, can afford to undersell the United States, and yet the importation from the United States rose from 16.8 per cent. of the whole in 1896 to 32.5 per cent. in 1898, and the total value of the cotton importations from the United States in 1898 was three times as much as those from China. And the same holds true of the cotton imports from India, which, though nearly four times as much as those from the United States in 1896, were but 66 per cent. more than the latter in 1898. The success of the American cotton in the face of this competition is attributed to its superior quality, and taking into consideration the firm hold that it has already acquired in the Japanese market, there is reason to think that with the lowering of the cost of transportation that would follow the opening of the Nicaragua Canal, the importation would rapidly increase. In the case of sugar, which is next in importance as an article of import, the United States naturally has no chance to compete. Cotton yarn stands next on the list of imports, and here again Japan derives her supply from other sources than from the United States, but the importation of this article is likely to decrease with the development of the Japanese cotton industries. In the case of kerosene oil, which stands next to cotton yarn, the imports from the United States have increased, in spite of the appearance of new rivals in the last two or three years. Tobacco is another article which the United States supplies in increasing quantities. An examination of the list of articles which make up the imports of Japan shows that the greatest number of them can be produced in the United States. It was estimated that in 1898 out of 275,000,000 yen only 75,000,000 yen represented the value of the imports which could not readily be supplied by the United States. The chief of the United States Bureau of Statistics mentions the following articles as all having shown a great increase in the amount exported from the United States to Japan: Raw cotton, leaf tobacco, iron and steel manufactures, flour, machinery, locomotive engines, cigarettes, and distilled spirits. The future of the trade of the United States with Japan will depend, of course, upon the rapidity with which the developing industries of Japan can suffice for supplying the needs of her population and also upon the condition of her agriculture. As to the latter, the figures for the last few years seemed to show that Japan is making larger and larger demands upon foreign countries for her food supply. In regard to manufactures, it has often been said that with so clever and adaptable a people improved methods of production would rapidly be introduced and the time would soon come when Japan would supply her home market with manufactured products. The recent history of Japanese manufactures does not seem to bear this out. The chief of the United States Bureau of Statistics cites the case of the watch factory at Osaka, which has in nowise met the home demand for watches, the importation of watches having rapidly increased. He also shows how a similar prediction that Japan would soon find a way of making bicycles to take the place of those which were imported has failed to come true, the number of bicycles imported in 1898

being double the number imported in 1896. Nor does it appear that the demand for foreign iron and steel manufactures has been seriously affected by the competition of native producers. The iron supply of Japan is not large, although the coal supply appears to be sufficient for her needs. Japan has not been able to devote the requisite amount of capital to the establishment of expensive factories for the making of iron manufactures. The chief of the United States Bureau of Statistics therefore sums up the conditions which seem to indicate the future of the United States trade with Japan in the following words: "As a whole, then, it may be concluded: First, that in the principal agricultural importations of Japan, raw cotton, tobacco, flour, and other foodstuffs, she is likely to increase her demands, and to look more largely to the United States than to any other part of the world to meet them. Second, that in cotton manufactures it is probable that she will supply the home demand, her cotton manufactories having rapidly increased during the past few years, until, as already indicated, their spindles now number more than 1,300,000, while her importations of manufactures of cotton have already begun to decrease by reason of the rapid increase in home production. Third, that in the large proportion of other manufactures—iron and steel and their various classes of manufactures, machinery of all sorts, printing-paper, leather goods, woollen goods, glass and glassware, fertilizers, material for her railways, and the thousand and one things which American ingenuity and modern appliances produce and make a matter of convenience or necessity—it seems likely that Japan will continue to call upon the outside world, as will also be the case with reference to foodstuffs other than the staples which she now produces in quantities usually sufficient to meet local demands."

Finance.—In the budget estimates for 1899 the expenditure for the year was estimated at 226,344,700 yen, and the revenue at 188,738,400 yen, showing a deficit of 37,606,300 yen. To meet this deficit the minister of finance proposed to increase the land tax and the tax on *saké*, or rice-beer, the national beverage, and to make certain additions to the income and registration taxes, by which the revenue for the year would be increased about 34,000,000 yen. The remainder of the deficit he proposed to make up from the Chinese war indemnity. He stated that these increases in the taxes should in 1900 make an increase in the revenue of nearly 45,000,000. Besides the items mentioned, important sources of Japanese revenue are the taxes on malt and *soy*, and the excises, posts, and telegraphs, state services, etc. The public debt was in 1897-98 about 428,241,302 yen, a considerable increase over the previous year. The added amount was, however, borrowed for railway construction and other internal improvements. The last dollar of Japan's foreign debt was paid in that year, leaving a blank for that item in the debt account of 1897-98.

Currency.—Japan has had a single gold standard since 1897. The legal ratio of silver to gold is $32\frac{1}{3}$ to 1. The monetary unit is the gold yen, containing 0.75 gramme of gold. The paper money of Japan formerly consisted of government notes, national bank-notes, and Bank of Japan notes, but the law of 1883 provided for the gradual retirement of the national bank-notes, whose circulation was prohibited by the law of 1896 after December 9, 1899; and since 1890 the government notes have been gradually redeemed, their circulation being prohibited by the law of June, 1898, after December 31, 1899. Thus, at the close of the year 1899 the Bank of Japan notes were the only paper money in Japan. This institution issues notes upon the currency principle—that is, it must keep an equal amount of specie reserve for all notes issued, but may issue 120,000,000 yen in addition on good security. Further issues are subject to a 5 per cent. tax. The main interest in the currency history of Japan has been the adoption of the gold standard and the withdrawal of silver from circulation. The means by which this was brought about and its effect upon the industrial and financial conditions of the country have been the subject of much discussion. The law establishing the single gold standard was promulgated in Japan on March 26, 1897. The new unit was to be the gold yen, one-half the mint value of the old gold yen. Every effort was made to prevent the change of standard from affecting prices and wages. The government adopted the ratio of 32.34 to 1 in the expectation that as the value of silver declined this would be the market ratio. It was hoped that this measure might have a steadying effect upon the value of silver and prevent its depreciation much below that point. The new standard was introduced in the following manner: In the first place, the government coined the stock of gold which it purchased from Europe with the Chinese indemnity money. It then exchanged the new gold coins for the old silver coins. This was accomplished with great rapidity, the two chief depositories of silver—namely, the Banks of Japan and Yokohama, exchanging their silver coins for gold on the day after the law went into effect. But silver depreciated below the legal ratio, and it was feared that counterfeited pieces of silver would be imported, in order to be exchanged for gold. To prevent this a law was passed prohibiting the circulation of silver yen after April 1, 1898, and another law

provided that the exchange of silver for gold at par could not be made after July 31, 1898. As a result of this policy the withdrawal of silver was completed by the close of the year 1898. The next serious question was how the government should dispose of the silver thus acquired. This was accomplished in these three ways: First, by recoinage the silver as subsidiary currency; second, by sale, and third, by exportation for circulation. The change of standards in Japan was brought about in a most skilful manner. The government disposed of the silver without loss, in spite of the great fall in its value, and the change was accomplished without causing any disturbance in the money market or affecting prices or wages, or the relations between debtors and creditors. The advantages claimed by the Japanese gold monometallists are that it has placed industries and commerce on a sound basis, rendered prices more stable, and vastly improved the condition of foreign trade. The frequent fluctuations of price on the former silver basis had imparted an element of risk to all industrial affairs and had especially retarded Japan's foreign trade with gold standard countries. As to the effect upon the government, it was claimed that the gold standard would save the losses often sustained by the government in its foreign payments on contracts, and there were already many signs that the national credit had improved.

Railways, Posts, and Telegraphs.—Japan possesses an extensive and well-managed railroad system. In 1872-73 the first state railway was built, 18 miles in length. In 1884-85 the first railroad was built by private capital, 63 miles long, at which time there were 181 miles of railway in the empire. According to the annual report of the imperial railway bureau for the fiscal year ending March 31, 1899, the total mileage was 3420, an increase of 472 miles for the year. About 770 miles were state roads. If there be added those railways under construction the total mileage of Japanese railways in 1898-99 reached the figure of 5810 miles. The total rolling stock of the 3420 miles open comprised 7103 locomotives, 3811 passenger coaches, and 14,088 freight-cars. Posts and telegraphs are under government control. In 1897-98 there were 12,539 miles of telegraph and 1555 miles of submarine and subfluvial cables; the telephone mileage was 528. The mails carried were 561,931,551 letters, postal-cards, packages, etc.

Army and Navy.—The army is organized, equipped and drilled upon the European system, and its officers have been trained in Europe. There is also a national military college of considerable efficiency. All males of the age of 20 are liable for three years' active service in the standing army, four years in the reserve, and five years in the territorial army. Every male from 17 to 40 years of age not in the above branches belongs to the national army, carrying liability to service in times of emergency. At the close of the Chinese War the peace-footing was about 70,000 and the war-footing 268,000. It is proposed to increase these numbers to 145,000 and 520,000 respectively. The navy, according to the classification adopted in this book for the European fleets, was reported in July, 1898, as consisting of 3 battleships, and 3 building; 1 armored cruiser, and 6 building; 10 protected cruisers, and 6 building; 8 unprotected cruisers, and 1 building; 3 coast defence ships, 1 torpedo vessel, 8 torpedo-boat destroyers in course of construction; 44 torpedo boats, and 12 building. The naval programme contemplates the creation by 1903 of a navy of 67 large ships and 12 torpedo-boat destroyers, with a total displacement of 260,000 tons. In 1899, 13 large and 52 small vessels were building, with a tonnage of 130,113. In that year 2 battleships, 2 cruisers, and 6 torpedo boats destroyers were launched.

HISTORY.

Internal Politics.—The Anglo-Russian agreement in regard to China (*q. v.*) was a subject of much discussion in Japan during the first half of the year 1899. The prevailing opinion seemed to be that this agreement meant the eventual dismemberment of China, and England's action occasioned some disappointment in Japan, since many had hoped for an alliance with that country for the purpose of developing China and maintaining its integrity. On the other hand, some of the prominent statesmen like Count Okuma were confident of the future of China, holding that such conventions did not in any way affect the interests of other powers or threaten the integrity of the Chinese Empire. It was a mistake, Count Okuma declared, for the powers to judge the Chinese people by the worthless Manchu dynasty that was on the throne. He held that at any time some man of spirit and influence might arise to awake in the people a consciousness of national interests. There were some disturbances in Corea in 1899, that country having been the scene of palace intrigues and internal revolts ever since the war with China. Some of these disturbances were traced to foreigners and certain criminal attempts were laid at the door of Japanese residents. The Japanese government in 1899 prohibited by ordinance all Japanese from going to Corea without special authorization. A new political party was formed in 1899 under the name of Hokken-to—that is, the national constitutional party. One of its objects appeared to be the support of the old national religions of Japan.

Shintoism and Buddhism, against the increasing power of Christianity. But this object was not popular, and the party gave up the religious feature of their platform and declared their sole purpose was to execute the purposes of the constitution. It was opposed in the press on the ground that it said too much about the prerogatives of the Mikado. The increase of the Japanese civil list was shown by some figures published in 1899. The number of government officers rose from 40,727 in 1896 to 70,123 in 1898, and the salaries increased in a still greater proportion. The lack of capital threatened an economic crisis in the early part of the year, but by midsummer affairs seemed to be on a prosperous footing. The government negotiated a foreign loan amounting to 250,000,000 francs, issued at 90 per cent. of the par value and bearing interest at 4 per cent. The expenses of the war with China appeared from figures published during the year. The total for the period of the war—that is, from June 1, 1895, to March 31, 1896, was 200,475,508 yen, of which 164,520,371 yen were for the army and 35,955,137 for the navy.

Foreign Relations.—On July 17, 1899, the treaties with foreign powers placing Japan's relations with them on a basis of common international law went into force. The countries with which these treaties had been made were Great Britain, United States, France, Germany, Russia, Austria, Italy, Spain, Portugal, Belgium, Holland, Denmark, Sweden and Norway, Peru, and Switzerland. This abolished the foreign consular jurisdiction and placed Japan on terms of equality with western nations. Foreign residents were thenceforth subject to Japanese courts. The entire country was thrown open to foreign trade, and the foreign residents were to have the same privileges as well as to be subject to the same obligations as natives. Formerly there had been only six treaty ports. Just before the treaties went into effect the Mikado ordered his ministers and officials to take the utmost care that foreigners should have the same privileges and advantages as natives. The government also announced that Christianity should receive equal protection with the national religions, and warned the people against any attempt to oppose Christianity by force. In spite of the non-sectarian attitude of the government there were signs before the close of the year of a reaction against the influence of Christianity. The department of education requires that religion be excluded wholly from the national system of education, and does not countenance private schools in which religion is taught. Since the war with China the progress of Christianity has been slow, and there has been a conservative reaction in favor of native creeds.

JAVA, the principal island of the Dutch East Indies, and the most important of the colonial possessions of the Netherlands, has been cited as an example for the United States to consider, in forming its government over the half-civilized peoples which have recently come under its jurisdiction. (See COLONIES.) It is acknowledged by all fair observers that the Dutch have governed Java well, with the result that it is now a prosperous colony. One of the characteristics of the Dutch rule has been the effort to elevate gradually the condition of the people, who are mostly ignorant and imbued with deep religious and caste prejudices. It has been a policy to rule the country through the natives, instead of forcing upon it a paternal government administered wholly by an alien people, and the Dutch have thus won the confidence and co-operation of the native chiefs. The latter do the work of governing under the advice of a Dutch resident or assistant resident, who gives orders under the form of recommendations. These recommendations are obeyed, and yet the native ruler has the show of power, and the people more readily acquiesce in his rule. The population is legally divided into Europeans and persons assimilated with them, and the natives and persons assimilated with these, and it is the fundamental principal of the Netherlands colonial policy to give to each of these divisions the kind of government best suited to its condition and desires. The former class, therefore, is generally living under the same laws as the inhabitants of the Netherlands itself, while jurisdiction over the natives considers the customs and institutions of the latter and is largely carried on through their chiefs, who are in constant intercourse with the Netherlands officials. Java and Madura are together administered by a governor-general of the Dutch Indies, with a council of five members, and by local officials. The "culture system" employed by the Dutch in Java has been the subject of some criticism, but on the whole it appears to have been productive of good. Some years ago the Dutch employed a forced system of labor among the natives, in the coffee, sugar, indigo, pepper, tea, tobacco, and other industries, but this was finally abolished, except in a few industries, principally the cultivation of coffee. It may be explained that the greater part of the soil of Java is government property, with some private estates in the western part of the island, and the great majority of the people are agricultural laborers. The government or private landowners can enforce one day's gratuitous work out of seven, or more, which work is largely confined, as already stated, to the coffee industry. Thus the natives, who are poor and naturally indolent and improvident, are forced to labor regularly. Much of the government property is let on hereditary lease, and the coffee

plantations being under government control, the cultivation of coffee by the natives is allowed to stand as the payment of taxes. Thus what at first seems a system of partial bondage proves to be a fairly good arrangement, whereby the ignorant native can contribute to the support of the government by giving his labor in the cultivation of the crop which furnishes the island's chief source of revenue. In addition, the native has paid, since the abolition of the culture system in other branches of agricultural production, the nominal sum of one guilder annually to the government.

The area of Java, together with the neighboring island of Madura, with which it is generally included, is estimated at 50,554 square miles, and the population of the two islands at the close of 1897 was estimated to be 25,697,701. The European population, largely Dutch, was about 52,000. There are also about a quarter of a million Chinese and 17,000 Arabs. The native population is Malaysian. The capital, Batavia, has 115,000 inhabitants, including 9500 Europeans; Surabaya and Surakarta have each over 100,000 inhabitants, and in the former about 7000 Europeans reside. The port of Samarang contains about 3400 foreigners. The principal Javanese occupation, agriculture, is facilitated by a fertile soil which has made Java a garden-spot in the Orient, and a large trade centre. No government land has been alienated since 1816, but by the agrarian laws of 1870 large leases have been made, those in 1896 aggregating 848,204 acres, distributed as follows: To 711 companies and Europeans, 814,427 acres; to 47 Chinese, 30,746 acres; to 6 natives, 3031 acres. Lands now the property of Europeans amount to 2,069,733 acres; Chinese, 639,999 acres; other foreign Orientals, 34,856 acres. The productions of Java include coffee, sugar, indigo, pepper, tea, tobacco, cinchona bark, and opium; among minerals are tin, coal, salt, and petroleum; in stock-raising are included (1895) about 2,650,000 buffaloes, 2,572,000 oxen and cows, and 485,500 horses. The last named are not used for agricultural purposes. Java yielded 118,881,288 pounds of coffee in 1898, mostly on government plantations; in 1899 it was estimated that the crop would amount to 149,672,776 pounds. About 547,000 tons of sugar were produced, according to the figures for 1897. The remaining crops are estimated for 1896: Cinchona, 3,797,828 kilogrammes; tobacco, 13,360,013; tea, 3,916,398; indigo, 721,719; tin, 15,600 tons; coal, 25,150 tons; petroleum, 111,387,385 litres. Among these various productions the chief exports are coffee, sugar, teas, cinchona, tobacco, indigo, tin, and petroleum. The imports include textiles, haberdashery, petroleum, spirits, wine, machinery, powder, and metals. Batavia, Samarang, and Surabaya are the principal ports. In 1896 the imports amounted to 168,348,635 guilders; exports, 199,630,711 guilders. The revenue of Java is largely obtained by the government sale of coffee, but a considerable income is also derived as follows: From land, a house-tax, tax on estates, customs duties, licenses, personal imports, the state monopolies of salt and opium, railways, and indirect taxes. The revenue for 1898 was 139,412,904 guilders, of which taxes made up 36.3 per cent., monopolies 24.1 per cent., the sale of government coffee, and cinchona, tin, and coal 22.4 per cent., and 17.2 per cent. came from other sources. The expenditure was 154,519,438 guilders. The budget estimates for 1899 gave the revenue as 132,742,514, and the expenditure as 146,085,944. The army is purely colonial and embraces about 41,660 men, including 1466 officers. Over 16,000 of the soldiers are Europeans. There is a military school near Batavia. The navy is partly colonial and partly royal, and the expenses are jointly borne by Java and the Netherlands. About 2600 men (including 1700 Europeans) are with the Indian marine, 25 ships; some 1500 Europeans and 400 natives serve with the auxiliary squadron.

JEFFERSON, CORNELIA (Mrs. Jackson), American actress, died in New York, March 3, 1899. She was the sister of the veteran actor, Mr. Joseph Jefferson, and was born in Baltimore, October 1, 1835. On the 17th of May, 1849, she appeared at Chanfrau's National Theatre, New York, as Little Pickle in *The Spoiled Child*. Subsequently, 1857-58, she acted in Laura Keane's theatre, New York; this was afterward called the Olympic, and here in the fall of 1867 Miss Jefferson appeared as Titania in *A Midsummer Night's Dream*. For many years she lived in retirement, but about ten years before her death entered the company of her brother Joseph and attracted much attention by her fine rendering of Tilly Slowboy in a dramatization of *The Cricket on the Hearth*.

JEWETT, SARA, a well-known American actress, died in Cambridge, Mass., February 27, 1899, in her fifty-third year. She was born in Buffalo, N. Y.; was educated at a school in Lenox, Mass., and privately in Cambridge. Here she attained a marked success in amateur theatricals, and when subsequently financial reverses came she determined upon the stage as a means of livelihood. She entered upon professional study in New York with Fanny Morant, through whom she met Augustin Daly; at his theatre, the old Fifth Avenue, she made her debut September 3, 1872, as Mabel Wyckoff in Bronson Howard's *Diamonds*. She continued in Daly's company for a number of years; at this time she played, it is said, on a tour covering 9000 miles. In 1879 she became the leading actress of the Union Square

Theatre Company, with which she played in all of the principal cities of the United States. Miss Jewett was never a very forcible actress, but her rôles were characterized by intelligent and sympathetic rendering. At the old Fifth Avenue Theatre she is remembered as Anne Page in *The Merry Wives of Windsor*, Mrs. Lynx in *Married Life*, and Maria in *The School for Scandal*. At the new Fifth Avenue Theatre she appeared in many rôles. Among her best remembered characters at the Union Square Theatre were Lillian Westbrook in *The Banker's Daughter*, the young wife in *Miss Multon*, Lea Henderson in *Daniel Rochat*, and Adrienne in *A Celebrated Case*. Her last appearance in New York was at this theatre in the spring of 1885, and the following year she retired from the stage.

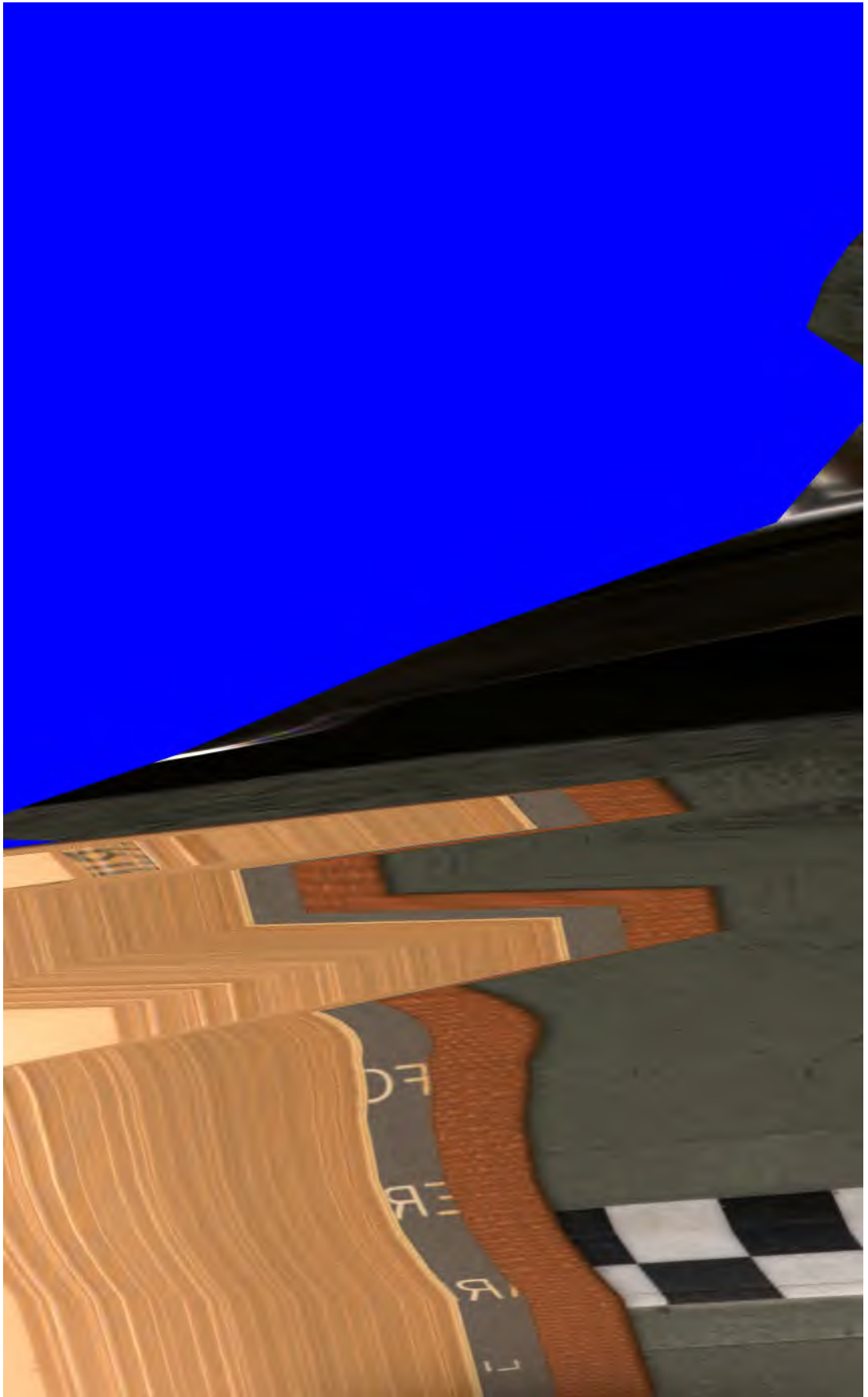
JEWISH WOMEN, COUNCIL OF, an association of Jewish women, organized in 1893, had in 1899 a membership of 5000. The purposes of the association are "to bring about closer relations among Jewish women, to furnish by an organic union a medium of communication and a means of prosecuting work of common interest, and to foster united efforts in behalf of Judaism by supplying means of study, and in the work of social reform by the application of the best philanthropic thought." General meeting for 1900 at Cleveland, O. President, Mrs. Hannah G. Solomon; secretary, Miss Sadie American, 3130 Vernon Avenue, Chicago, Ill.

JEWS. *In the United States.*—In 1899 the Jews in the United States showed much progressive spirit both in benevolent and educational work. The National Hospital for Consumptives, established the past year in Denver, Col., was largely contributed to by the Jewish order of B'nai B'rith. In New York the Baron de Hirsch Trade School, the Clara de Hirsch Working Girls' Home, and the Hebrew Charities Home have been added to the list of Jewish charitable institutions. The National Association of Hebrew Charities was organized at Cincinnati; and the Jewish Women's Council, the Jewish Chautauqua, and the National Farm School at Doylestown, Penn., report satisfactory growth. Zionism was confined to Russian-American Jews. The Jewish Theological Seminary of New York chose as its director Professor Schlechter. The immigration of Jews into the United States for the year ending June, 1899, was 37,415. In 1899 the Jews reported 301 ministers, 570 congregations, and 1,043,800 members.

Zionist Movement.—In August, 1899, the third Zionist congress was held at Basle, Switzerland, and was attended by about 300 delegates. Dr. Theodor Herzl, one of the foremost men in the movement, presided over the congress. The objects of the Zionists have been summed up by one of their leaders as follows: (1) To acquire a legally secured home in Palestine for the Jewish people; (2) to foster a national spirit among them; (3) to hold international congresses to consider the condition of Jews all over the world; (4) to support the existing colonies and found new ones; (5) to encourage the study of Hebrew literature and the use of Hebrew as a living language. In its most recent aspects Zionism aims at the settlement of Jews in Palestine and the placing of them on a footing of independence. It has been said that the Jewish colonies in Palestine have hitherto been too dependent upon charity. The former society of Zion was largely philanthropic in character and its concern was limited to the Jews of Palestine and of Roumania and Russia. Zionism in its present form applies to the whole Jewish race, and is no longer a plan for the establishment of pauper colonies from those regions where the Jews are in an especially distressed condition. It aims to create an independent Jewish community in Palestine, and the first requirement is to obtain from the Sultan legal guaranties for the autonomy of this community. The total population in Palestine is estimated at 250,000, of whom the Jews form more than one-third. The agricultural resources of the country are said to be ample for the support of a large population. The work of the Zionist organization is carried on by a central committee in Vienna, with Dr. Herzl at its head. Each Zionist pays a shilling to the central fund. The members of the committee are elected from the Zionists all over the world. The local societies hold frequent meetings in the different countries. In Vienna is published the newspaper organ of the society.

The Jewish Population.—The following figures, compiled from the *American Jewish Year Book*, shows the Jewish population in various parts of the world. In Russia, 5,700,000; in Austria-Hungary, 1,860,106; in United States, 1,043,800; in Germany, 567,884; in Turkey, 350,000; in British possessions, 148,130; in various other parts of the world, 1,058,571—total, 10,728,491.

JOACHIM, AMALIE SCHNEEWEISS, a well-known contralto, died in Berlin, February 4, 1899. She was born at Marburg, in the Austrian province of Steiermark, May 10, 1839. In early life she sang in minor parts in Hermanstadt and Vienna and later in the Hanover Court Opera. She was regarded by some critics as the greatest German singer of ballads, *lieder*, and oratorios. In 1863 she married the violinist, Joseph Joachim; she soon gave up the opera for concert work, and became famous throughout Germany. She appeared in Boston in 1892.



and Democratic opponents, respectively. On the 23d of August, 1899, Mr. Jones announced himself an independent candidate for governor of Ohio on the platform of "direct legislation, public ownership of public utilities, union wages, hours, and conditions for skilled labor, and an eight-hour day with living wages for unskilled labor on all public works." The vote he received was surprisingly large, especially since the contest between the Republicans and Democrats was unusually bitter and was fought out chiefly on national lines. The vote in round numbers was: Nash, Republican, 417,000; McLean, Democrat, 368,000; Jones, Independent, 106,000.

Mr. Jones was born in Wales in 1846, and came to the United States with his parents when he was three years old. His family was poor, and in childhood he was obliged to work. He went to Titusville, Penn., in 1864, and was employed in the oil fields. Having later engaged in the business for himself in Pennsylvania, Ohio, and West Virginia, he invented an improved oil-well appliance and established the Acme Sucker Rod factory at Toledo. Here he introduced a number of labor reforms.

JOUBERT, PETRUS JACOBUS, commander-in-chief of the Transvaal forces in the war which broke out in October, 1899, has for many years been prominent in the political and military life of his country. He was born about 1831. General Joubert is regarded as an able military leader and tactician, and has won eminent success in making his troops a formidable body by employing the ambushade methods so well adapted to the veldt and kopjes. In the fall of 1899 he was in personal command of the troops in northern Natal; it was his men who fought the first battles of the war and afterward besieged Ladysmith and repulsed General Buller near Chieveley. A report toward the close of the year stated that General Joubert had been wounded; this was afterward denied with the statement that the general was ill and had gone to Pretoria; still later it was asserted that he had returned to the front. It was he who defeated Sir George Pomeroy Colley at Majuba Hill, February 27, 1881. The commander-in-chief at this time was Paul Kruger. In January, 1896, the surrender of Dr. Leander S. Jameson, leader of the famous Raid, was chiefly due to Joubert. In 1893 and in 1898 he stood for the presidency of the republic, but was defeated by President Kruger. From his treatment of British prisoners toward the close of 1899 General Joubert came to be regarded as a very humane leader.

JULIAN, GEORGE WASHINGTON, ex-member of Congress, died at his home in Irvington, Ind., July 7, 1899. He is remembered especially as one of the more prominent antislavery leaders. He was born near Centreville, Ind., May 5, 1817; was educated at the district schools, taught for three years, studied law, and was admitted to the bar in 1840, beginning practice at Centreville. In 1845 he was elected as a Whig to the legislature, and in 1849 was elected to Congress on the Free Soil ticket. In the Congressional election of 1851 Julian was defeated; the following year he was the Free Soil candidate for Vice-President, the ticket being headed by John P. Hale. In Congress he supported the homestead policy and opposed the compromise measures. In 1856 he was a delegate to the first Republican national convention. From 1861 to 1871 he again represented his district in Congress, where he was a member of the committee on the conduct of the war, and later of the committee on reconstruction. Julian's speeches in the House of Representatives are placed by many among the ablest antislavery utterances of the war period. In 1872 he joined the Greeley movement, after which he remained a member of the Democratic party. He was surveyor-general of New Mexico from 1885 to 1889. He published: *Political Recollections; Speeches on Political Questions*, 1872; *Later Speeches*, 1889; *The Life of Joshua R. Giddings*, 1892.

KAIULANI, Princess, heiress-apparent to the Hawaiian throne in the time of the monarchy, died in Honolulu, March 6, 1899. She was the daughter of a Scotchman, A. S. Klegghorn, and the late Princess Likelike, sister of former Queen Liliuokalani, and was born October 16, 1875. She had received a good education, chiefly in England. She was declared heiress-apparent by Queen Liliuokalani when the latter came to the throne in March, 1891. Upon the establishment of the Republic of Hawaii, Princess Kaiulani took the oath of allegiance, and thereafter received a pension from that government.

KALAGUA. See TUBERCULOSIS (paragraph on Treatment).

KANSAS, a central western State of the United States, has an area of 82,080 square miles. The capital is Topeka. Kansas was admitted to the Union January 29, 1861.

Agriculture.—The report of the State Board of Agriculture for the calendar year 1899 gave the yield of winter wheat as 42,815,471 bushels. The yield of corn was 225,183,432 bushels, the largest crop on record excepting that of 1889, and more valuable than any preceding crop by \$1,134,627. Wheat, corn, and oats yielded a combined crop of a home value of \$80,888,622, an increase over the value of the same

grains in 1898 of \$13,384,621. Secretary Coburn, speaking of the conditions of 1899, said the farmers of Kansas were in a most gratifying state of prosperity and contentment. Almost every farmer is replacing his old machinery with up-to-date improvements. "I cannot give detailed statistics, but, judging the whole State by several sample counties I am familiar with, I think it is safe to say that not less than \$200,000,000 of farm and home mortgages have been paid off in Kansas during the last few years."

Industries.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$866,228. There were 57 manufacturers of tobacco and 307 of cigars, and the total output was 22,036,125 cigars, and 34,719 pounds of smoking tobacco. Grain and fruit distilleries in operation numbered 5; the production of fruit brandy was 43 gallons; amount of spirits rectified, 2402 gallons; distilled spirits gauged, 15,375 gallons; production of fermented liquors, 7812 barrels; and manufacture of oleomargarine, 14,132,277 pounds. In 1899 the entire lead and zinc mining district of Missouri-Kansas was the scene of marked activity. Many new properties were developed, a large number of combinations perfected, and, stimulated by the increased market price of zinc, numerous abandoned mines were reopened and worked to large advantage. The output of ore for the first quarter of 1899 was an increase of 560 carloads, representing an advance of \$1,198,822 over the corresponding period of 1898, and by December 10 the output exceeded \$10,000,000 in value, and bid fair to equal \$12,000,000 by the end of the year. On October 25 the wheels of the first cotton mill established in Kansas, in Independence, were started for the first time. Only twine was made at the start, but in the spring of 1900 the plant is to be enlarged in building and machinery for the manufacture of white duck cloth and seamless sacks. The first effect of this new enterprise was the enlargement of the cotton-growing area of the State. In all lines of industry, the year 1899 was one of extraordinary prosperity in Kansas, and special results are noted under paragraphs Agriculture and Banks.

In 1898 Kansas regained the third place as a producer of salt, changing ranks with Ohio, with an output of all kinds of 1,538,327 barrels, valued at \$488,022. Coal from 110 mines yielded 3,406,555 short tons, valued at \$3,703,014, an increase over the production of 1897 of 352,543 tons, and the largest in the history of the State. The most productive counties were: Crawford, 1,654,493 tons; Cherokee, 1,110,527; and Leavenworth, 305,576. Quarrying yielded \$325,133, chiefly in sandstone and limestone.

Banks.—On October 31, 1899, there were 98 national banks in operation and 122 in liquidation. The active capital aggregated \$8,137,100; circulation, \$2,616,305; deposits, \$25,364,367, and reserve, \$9,577,480. The State and private banks, June 30, 1899, numbered 368, and had capital, \$6,438,050; deposits, \$23,753,675, and resources, \$33,041,702. The exchanges at the United States clearing-houses at Topeka and Wichita in the year ending September 30, 1899, aggregated \$54,013,222, an increase of \$4,191,206 in a year.

Railways.—The new railroad construction during the calendar year 1898 was 3.77 miles, and during 1899, 11 miles, giving the State a total mileage of 8807.97.

Education.—At the close of the school year 1897-98 the school population was 495,949; enrolment in the public schools, 370,240, and average daily attendance, 256,934. There were 12,513 teachers, 9188 buildings used as school-houses, and public school property valued at \$9,504,961. The revenue was \$4,003,584; expenditure, \$3,991,477, of which \$2,935,043 was for teachers' salaries. There were 176 public high schools, with 434 secondary teachers, 11,595 secondary students, and 1905 elementary pupils; 15 private secondary schools, with 63 teachers, 763 secondary students, and 664 elementary pupils; 1 private normal school, with 37 teachers and 1957 students in all departments; and 6 private ones, with 69 teachers, and 1741 students. Normal training was also given in 9 colleges and 11 public high schools. Nineteen colleges for men and for both sexes reported 7 scholarships, 376 professors and instructors, 4950 students, 107,857 volumes in the libraries, valued at \$130,600; \$185,175 invested in scientific apparatus, \$1,811,500 in grounds and buildings, and \$397,155 in productive funds; \$269,633 in total income, and \$123,874 in benefactions. In 1899 there were 724 periodicals, of which 49 were dailies, 610 weeklies, and 54 monthlies.

Finances.—In 1899 the total assessed valuation was \$327,175,107, an increase in a year of \$1,285,360; the bonded debt remained the same in amount as in 1898, but all of it had been acquired by the State school fund.

Population.—As estimated by federal officials the population on June 30, 1899, was about 1,380,000.

Legislation.—Dealing in futures and "bucket shop" transactions were prohibited under heavy penalties. Building and loan associations were placed under the supervision of the bank commissioner and a very comprehensive law was passed regulating them. City courts were established and justices of the peace in cities ousted of

jurisdiction. The board of police commissioners, created originally to enforce the prohibitory liquor law, was abolished. It is expected that this will practically bring about local option or home rule in liquor matters. American insurance companies not of the State of Kansas must pay 2 per cent. State tax and foreign companies 4 per cent., upon gross incomes. This law will probably add \$60,000 annually to the State treasury. A "Charter Board," composed of the attorney-general, secretary of state, and state bank commissioners, was created. It grants all charters and regulates foreign insurance companies doing business in the State, inquiring as to their solvency. A constitutional amendment increasing the Supreme Court judges from five to seven will be voted upon in 1900. The political disabilities of those who bore arms against the United States have been removed. The offices of fish warden and of oil inspector were created. The formation of mutual hail insurance companies to protect growing crops was authorized. The anti-trust law, already enacted, was strengthened.

A Court of Visitation, vested with unusual authority, was created to take the place of the board of railroad commissioners, which has been abolished. The three judges are elective in 1900, but were appointed for the interim. This court is to be in perpetual session, and has been given greater power over railroads and express and telegraph companies than can be exercised by their own board of directors or general officers. It has legislative, executive, and judicial powers within itself. It fixes rates and determines their reasonableness; it apportions charges among common carriers, classifies freight, compels train service, orders the building of stations, regulates crossings, and prescribes rules for the running of trains. In short, all railroads are operated under its direction and guidance. When its orders are disobeyed, it tries the offender, making its own rules of procedure. Any person may complain, and at the cost of the State and with the aid of numerous officials created for the purpose, the so-called trial is obtained. The court may grant injunctions and appoint receivers, being given both common law and equity powers, and may appoint masters, referees, and marshals to carry out its orders. The law provides also that the court investigate strikes, and if it finds the railroad at fault it shall rectify matters by orders, and if the company does not obey the order, the court shall seize and operate the road. If the strikers are at fault it shall order them to cease the strike. In questions of rates or service raised by any complainant, the company is presumptively wrong in the first instance; it is presumed to be guilty until it proves its innocence. The court has apparently unlimited power to punish for contempt. In a word, it is both judge and executor. No suit can be dismissed or compromised without the consent of the court, and failure to comply with any of its orders subjects the corporation to a fine of \$1000 a day. This is regarded as the most surprising piece of railroad legislation ever enacted.

The labor legislation presented features as novel as the railroad legislation. It provides for an annual convention of labor organizations. The delegates are to elect a president, vice-president, secretary, and assistant secretary; these shall constitute the State board of labor and industry. The secretary shall be the commissioner of labor and industry and factory inspector, and the assistant secretary shall be his assistant. Miners are to hold a similar convention, and the secretary elected by such convention shall be the State inspector of mines. This election of salaried State officials by a part of the citizens acting in irresponsible conventions has evoked criticism. It was further enacted that wages must be paid in money.

Elections, etc.—The local elections in 1899 were reported to show an aggregate Republican majority of nearly 10,000 over the combined Democrats and Populists. A legislative investigation into the affairs of the Kansas Agricultural College resulted in the substitution of two Republicans for two Populist members of the board of regents; and with a view to the elimination of an alleged Populist political propaganda in the institution, the following members of the faculty were removed from their places June 12: President Thomas E. Will; Frank Parsons, professor of history and political science; Edward Bemis, professor of economic science; Dr. J. H. Ward, professor of English language and literature; and Secretary M. H. Phipps.

State Officers and National Representatives.—Governor, W. E. Stanley; lieutenant-governor, H. E. Richter; secretary of state, G. A. Clark; treasurer, Frank E. Grimes; auditor, George E. Cole; attorney-general, A. A. Godard; superintendent of education, Frank Nelson; commissioner of agriculture, F. D. Coburn; adjutant-general, S. M. Fox; superintendent of insurance, W. V. Church. Supreme Court: Chief justice, Frank Doster; associate justices, William R. Smith, W. F. Johnston; clerk, D. A. Valentin. The State legislature consists of 103 Republicans, 2 Democrats, 29 Populists, 1 Independent, and 30 Fusionists. Senators: William A. Harris (Pop.), from Linwood, and Lucien Baker (Rep.), from Leavenworth. Representatives: W. J. Bailey (at large), from Baileyville; Charles Curtis, from Topeka; J. D. Bowersock, from Lawrence; E. R. Ridgely (Pop.), from Pittsburg; J. M. Miller,

from Council Grove; W. A. Calderhead, from Marysville; W. A. Reeder, from Logan; and Chester I. Long, from Hutchinson—all Republicans but one.

KAOLIN. The production of kaolin or of china clay in 1898 was:

States.	Quantity, Short Tons.	Value.	States.	Quantity, Short Tons.	Value.
Colorado.....	60	\$135	North Carolina.....	10,000	\$90,000
Connecticut.....	1,500	18,750	Pennsylvania.....	13,502	67,492
Delaware.....	14,968	82,296	Vermont.....	1,050	7,800
Missouri.....	1,850	6,990	Wisconsin.....	5,000	47,500
New York.....	60	60			

KAUTZ, ALBERT, rear-admiral, United States Navy, was born in Georgetown, O., January 29, 1839; he graduated from the United States Naval Academy at Annapolis in 1859 and was promoted midshipman in 1861. In that year he also became master and lieutenant, and was taken prisoner of war. He served as Farragut's flag-lieutenant on the *Hartford* at the capture of New Orleans and also during the Vicksburg attacks. He was promoted lieutenant-commander in 1865, commander in 1872, captain in 1885, commodore in 1897, and rear-admiral in 1898, being assigned to the command of the Pacific station, with the *Philadelphia* as his flagship. On March 6, 1899, the *Philadelphia* arrived at Samoa (*q. v.*), where native troubles had broken out. Admiral Kautz at once issued a proclamation, restoring the authority of the chief justice and placing Malietoa Tanu upon the throne. He joined the British in resisting Mataafa, whose cause was favored by the Germans. A body of men composed of British and Americans was ambushed on April 1, and several British and American officers and men were killed.

KEAN, JOHN, United States senator from New Jersey, was elected, as a Republican, by the legislature to succeed James Smith, Jr., Democrat, January 24, 1899. Born at Ursino, N. J., December 4, 1852, he was educated at private schools, and in 1872 entered Yale, but left the university to study law, and graduated at the Columbia Law School in 1875, two years later being admitted to practice in his native State. In 1882 he was elected to the Forty-eighth Congress and in 1886 to the Fiftieth. He was chairman of the Republican State committee in 1891 and 1892, and in the latter year was defeated for governor by Mr. George T. Werts. In 1894 he was a member of the commission appointed to revise the State judiciary and practice, and in 1896 was elected a delegate at large to the Republican national convention. Mr. Kean is president of the National State Bank of Elizabeth, and holds office in several corporations. His term in the Senate will expire March 3, 1905.

KEELEY, Mrs. ROBERT, an English actress of prominence, died in London, March 12, 1899, in her ninety-third year. She was born at Ipswich, her maiden name being Goward. She made her first appearance in 1825 at the Lyceum Theatre, London, in the title-rôle of *Rosina*. Later in life she achieved great success in dramatizations of several of Dickens's novels. Her husband, a popular comedian, died in 1860. On November 22, 1895, her ninetieth birthday was celebrated at the Lyceum Theatre, London, at which a large number of artists and society people were present.

KELLOGG, SAMUEL H., D.D., Presbyterian missionary to India, was born at Westhampton, L. I., in 1839. His death occurred May 2, 1899, and was caused by a fall over a precipice while he was cycling in the Himalayas, near Landour. After his graduation at Princeton in 1861 he taught mathematics there for a number of years. From 1865 to 1877 he was a missionary in India; returning in the latter year to the United States, he accepted in the Western Theological Seminary the chair of theology, which position he filled till 1886. He subsequently returned to India, and at the time of his death was engaged with two other scholars upon the translation of the Old Testament into Hindustanee; this work was prosecuted under the direction of the Presbyterian Missionary Society of the United States and the British and Foreign Bible Society. Among Dr. Kellogg's writings are an authoritative Hindustanee grammar; *Lectures on Genesis and the Growth of Religion*; *The Jews*; *The Light of Asia and the Light of the World*.

KEMP, DIXON, yacht designer, died in England, November 21, 1899, in his sixtieth year. He had been yachting editor of the London *Field* since 1862, and he was the architect and designer of many steam and sailing yachts. He was instrumental in establishing the Yacht Racing Association in 1875, and he founded, two years later, *Lloyd's Yacht Register*. His work *Yacht and Boat Sailing*, 1878, was supplied to the ships of the royal navy by the British admiralty. An eighth edition of the work was published in 1895. In 1899 he published *An Exposition of Yacht*

Racing Rules. Other works written by him were *Yacht Designing* and *Yacht Architecture*.

KENDALL, EZRA OTIS, sometime professor of mathematics and astronomy at the University of Pennsylvania, died in Philadelphia, January 5, 1899. He was born at Wilmington, Mass., in 1816. Professor Kendall won a distinguished place among American mathematicians; he was a member of many educational societies and for years was vice-president of the American Philosophical Society. For a time he was vice-president of the university and dean of the faculty.

KENTUCKY, an east central State of the Mississippi Valley, has an area of 40,400 square miles. The capital is Frankfort. Kentucky was admitted to the Union, June 1, 1792.

Mineralogy.—During the calendar year 1898 the State again broke her remarkable record as a coal producer, having an aggregate output from 116 mines of 3,887,908 short tons, valued at \$3,084,551, a net increase in a year of 285,811 short tons. The amount mined by machinery was approximately 1,400,000 short tons, an increase of 100,000 tons over 1897. In both 1897 and 1898 Hopkins County was the largest producer, with Ohio County second and Whitley County third. The first two had a decreased and the last an increased production. In May, 1899, southeastern Kentucky was the scene of a rush of oil-lease hunters, because of the completion of a 40-mile pipe-line from Somerset to Slickford, on Otter Creek, 10 miles southwest of Monticello, the county seat of Wayne County and headquarters for oil operators. Up to that date 51 wells had been drilled in Wayne County, including 3 drilled for salt, and 33 of them had yielded oil, some only a small amount, others thousands of barrels. The new pipe-line furnishes the means of reaching a market, and its completion was the signal for renewed pumping of old wells and the drilling of new ones. Later in the year valuable zinc lands were discovered at a point less than 100 miles from Cincinnati and near a large railroad system, and in October the working of the first mine there was begun with highly promising results. During 1898 the production of iron ore was 12,913 long tons, and the quarries yielded sandstone and limestone valued at \$156,485.

Manufactures.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$22,215,234, the fourth largest amount collected in the States. There were 139 manufacturers of tobacco and 335 of cigars, and the total output was 46,287,459 cigars, 32,680,227 pounds of plug tobacco, 348,281 pounds of fine cut, 4,625,913 pounds of smoking, and 149,714 pounds of snuff. Grain and fruit distilleries in operation numbered 368; the production of fruit brandy was 14,852 gallons; amount of spirits rectified, 5,880,202 gallons; distilled spirits gauged, 46,082,575 gallons, and production of fermented liquors, 434,528 barrels. The coking industry was represented by 5 establishments, with 292 ovens, only about one-half of which were in operation, which used 44,484 short tons of coal, and produced 22,242 short tons of coke, valued at \$32,213, a decrease in a year of 9875 tons. The production of pig-iron was 100,724 long tons, and of all kinds of rolled iron and steel, 39,239 long tons. Kentucky and Alabama together had an output of 3588 long tons of iron and steel structural shapes and 28,713 long tons of iron and steel plates and sheets.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the delivery port of Louisville aggregated in value \$267,870, a decrease in a year of \$3205; exports, none.

Railways.—The new railway construction during 1898 was 19 miles, and during 1899, 7.50 miles, giving the State a total mileage of 3093.96. In July, 1899, the Louisville and Atlantic Railroad Company was incorporated by a syndicate, with a capital of \$2,000,000, to acquire and operate the Richmond, Nicholasville, Irvine, and Beattyville Railroad, sold under order of the Federal Court. On June 29 the State Board of Railroad Commissioners rendered a decision, in response to the commercial organizations, coal miners, and operators of the State, suspending the long and short haul clause of the constitution with respect to freight rates within the State.

Banks.—On October 31, 1899, there were 74 national banks in operation and 38 in liquidation. The active capital aggregated \$11,075,900; circulation, \$6,963,602; deposits, \$18,517,131, and reserve, \$6,717,158. The State banks, June 30, 1899, numbered 216, and had capital, \$13,119,533; deposits, \$33,017,134, and resources, \$54,827,722. The exchanges at the United States clearing houses at Lexington and Louisville in the year ending September 30, 1899, aggregated \$410,133,018, a net increase of \$48,479,259 in a year.

Education.—The latest school census reported is that of 1896, which, as revised, showed a school population of 736,105. At the close of the school year 1896-97, the last for which detailed reports were available at the time of writing, the enrolment in the public schools was 501,893, and the average daily attendance, 308,697. There

were 7989 buildings used as school-houses, and public school property valued at \$5,448,814. The revenue was \$2,753,664; expenditure, \$2,650,190, of which \$1,342,870 was for teachers' salaries. There were 61 public high schools, with 214 secondary teachers, 4754 secondary students, and 847 elementary pupils; 87 private secondary schools, with 306 teachers, 3621 secondary students, and 4730 elementary pupils; 4 public normal schools, with 15 teachers and 1358 students in all departments, and 10 private ones, with 58 teachers and 2043 students. Normal training was also given in 4 colleges and 19 public high schools. Thirteen colleges and universities for men and for both sexes reported 2 fellowships, 136 scholarships, 241 professors and instructors, 4072 students, 82,187 volumes in the libraries, valued at \$86,000; \$68,940 invested in scientific apparatus, \$1,265,500 in grounds and buildings, and \$1,372,495 in productive funds; \$254,523 in total income, and \$36,881 in benefactions. Eleven colleges for women reported 132 professors and instructors, 1315 students, 12,300 volumes in the libraries, \$5800 invested in scientific apparatus and \$447,000 in grounds and buildings, and \$87,406 in total income. An interesting educational feature of 1899 was the establishment of a department of practical forestry in Berea College, which is situated in one of the richest timber districts in the State. In 1899 there were 183 periodicals, of which 18 were dailies, 142 weeklies, and 14 monthlies.

Finances.—The total assessed property valuation as equalized was \$552,877.907 in 1898 and \$563,288,686 in 1899; the State tax rate in 1899 was \$5.25 per \$1000; the total bonded debt, excluding special bonds for \$2,312,596, held by State educational funds, on January 1, 1899, was \$1,171,394, and the floating debt, \$764,000, with a sinking fund of \$698,000, leaving net floating debt, \$66,000.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 2,220,000.

Party Conventions and Platforms.—The Democratic convention met at Louisville, June 24, and after a protracted session nominated State Senator William Goebel (*q. v.*) for governor. The platform drawn up at that time reaffirmed without any qualification the principles and policies of the Chicago platform of 1896; declared for the 16-to-1 ratio; denounced the national administration "for its reckless extravagance in the conduct of public affairs, for its cruel and inhuman neglect in its treatment of our soldiers and sailors during the late Spanish war," and for its alleged protection and encouragement of trusts, which were declared to be the fruit of Republican monopoly and tariff laws, and especially condemned its Philippine policy. Mr. Bryan's principles were endorsed. In State affairs the platform endorsed the election law known as the Goebel law and the "law to prevent extortionate, unfair, and discriminating freight rates by transportation companies," both of which were passed by the last legislature over Governor Bradley's veto. The master of the convention was Mr. Goebel, and his methods were so bitterly denounced by influential members of the party that another convention was held at Lexington, August 16, which nominated an independent or anti-Goebel ticket, headed by ex-Governor John Young Brown. This convention was remarkable for its numbers: it was, moreover, a gathering of farmers, business men, and others who had taken little part in politics hitherto, but who were determined in their purpose to defeat Goebel. Their platform also upheld Mr. Bryan and condemned President McKinley for the alleged advancement of the interests of trusts, but was mostly devoted to a detailed denunciation of Mr. Goebel, his election law, and his political methods.

The Republican convention met at Lexington, July 13, and unanimously nominated Mr. W. S. Taylor, the attorney-general of the State. The platform endorsed the McKinley administration; denounced all combinations formed "to depreciate below its real value or to enhance the cost of any article, or to reduce the proper emolument of labor;" declared confidence in the policies adopted by the President with regard to Cuba, Puerto Rico, and the Philippines, and pledged him support until the objects sought should be attained; reaffirmed adherence to the principles enounced by the last Republican national convention, except as to the civil service; commended the present amendment of civil service rules by the President, and advocated further modifications. A large part of the platform was naturally devoted to State affairs, and quite as naturally it approved Governor Bradley's administration and denounced the Goebel Election law, the Penitentiary bill, the McChord Railway bill, and many other measures originating with the Democratic legislature.

Elections.—Local issues and personal antagonisms among the Democrats rendered the gubernatorial contest one of unusual complexity and bitter feeling. The fact that Kentucky is a doubtful State aroused national interest in a campaign immediately preceding a "Presidential year." For weeks after election day, November 7, each of the two great parties claimed the election of its candidate with such fierceness and persistence that fears of disorder and violence were justified. On December 9, however, Mr. Taylor was given a certificate of election, and though he assumed control of the government, the Goebel Democrats determined to bring the matter

before the legislature, and at the close of the year the State was in a condition of great political tension. According to the official returns, the vote was as follows: William S. Taylor (Rep.), 193,714; William Goebel (Dem.), 191,331; John Young Brown (Ind. Dem.), 12,140; John G. Blair (Pop.), 2936; O. T. Wallace (Pro.), 2346, and Albert Schumtz (Soc. Lab.), 510.

State Officers and National Representatives.—Governor, W. S. Taylor; lieutenant-governor, John Marshall; secretary of state, Caleb Powers; treasurer, Walter R. Day; auditor, John S. Sweeney; superintendent of public instruction, John Burke; commissioner of agriculture, J. W. Throckmorton; attorney-general, Clifton J. Pratt; adjutant-general, D. Collier. Court of Appeals: Chief justice, James H. Hazelrig; justices, J. D. White, B. L. D. Guffy, George Du Relle, A. Rollins Burnam, T. H. Paynter, J. P. Hobson; clerk, Samuel J. Shackelford. The State legislature consists of 85 Democrats and 53 Republicans. Senators, William Lindsay (Dem.), from Frankfort; William J. Deboe (Rep.), from Marion. Representatives, Charles K. Wheeler, from Paducah; Henry D. Allen, from Morganfield; John P. Rhea, from Russellville; David H. Smith, from Hodgenville; Oscar Turner, from Louisville; Albert S. Berry, from Newport; Evan E. Settle, of Owenton; G. G. Gilbert, from Shelbyville; Samuel J. Pugh (Rep.), from Vanceburg; T. Y. Fitzpatrick, from Prestonburg, and Vincent Boering (Rep.), from London—all Democrats but two.

KERR, NORMAN SHANKS, M.D., English inebriate specialist, died May 31, 1899. He was said to be the most skilful physician in England in the treatment of inebriety. He was consulting physician to the Dalrymple Home for Inebriates, London, and was president of the Society for the Study of Inebriety. Among Dr. Kerr's works are: *Intemperance and its Remedy*, 1877; *Wines, Scriptural and Ecclesiastical*, 1882; *Inebriety: Its Etiology, Pathology, Treatment, and Jurisprudence*, 1888.

KIAO-CHAU. In the autumn of 1898 it was announced that the port of Kiao-Chau was opened freely to the commerce of all nations, and that a Chinese customs house had been established within the German district. It was further stated that citizens of all nations might settle in Kiao-Chau under the same conditions as the Germans themselves, and that the government would grant no trade monopolies. Plans were set on foot for developing the colony by opening direct communication with the interior, and projects for the railway development through private capital were formed. The chief purpose which the Germans appeared to have in view was to use Kiao-Chau as a distributing point for German commerce with the interior of China.

KIEPERT, HEINRICH, German geographer, died April 21, 1899. He was born in Berlin, July 31, 1818; was educated at Berlin University. He explored Asia Minor in 1841. From 1845 to 1852 he was director of the Geographical Institute at Weimar; he then returned to Berlin, and became a member of the Academy of Sciences, and a lecturer in the university. In 1859 he was given a professorship. For one of his Oriental atlases he received in 1844 a prize from the French Institute. Among his best known works are his map of Asia Minor and the atlas illustrating Robinson's biblical researches in Palestine.

KING, JOHN M., principal of the Manitoba Presbyterian College, died in Winnipeg, March 5, 1899. He was born in Roxburghshire, Scotland, in May, 1829. Having been educated at Edinburgh University, he came to Canada in 1856, and for many years was pastor of a Presbyterian church in Toronto. In 1883 he was moderator of the Presbyterian General Assembly, and the same year became principal of Manitoba College.

KING'S DAUGHTERS AND SONS, INTERNATIONAL ORDER OF THE, an interdenominational religious order of service founded in 1886, was estimated to have in 1899 over 500,000 members. These are bound to serve the needy and the suffering. President, Mrs. F. Bottome; secretary, Mrs. Isabella Charles Davis, 156 Fifth Avenue, New York City.

KIPLING, RUDYARD. See LITERATURE.

KIRKPATRICK, Sir GEORGE A., K.C.M.G., LL.D., former lieutenant-governor of Ontario, Canada, and an ex-speaker of the House at Ottawa, died December 12, 1899. He was born at Kingston, Ontario, in 1841, and was graduated from Trinity College, Dublin. He became a barrister in 1865; member of the Canadian House of Commons 1870-92, speaker 1882-87, a Queen's counsel 1880, Queen's privy counsel for Canada, 1891, and lieutenant-governor of Ontario 1892-97.

KNIGHTS OF LABOR, organized in 1869, the general assembly being organized in 1878, had in 1899 an estimated membership of 200,000. General master workman, John W. Parsons; general secretary-treasurer, John W. Hayes, 43 B Street, Washington, D. C.

KNIGHTS TEMPLARS, the twelfth degree of Masonry, reported for 1899, 43 grand commanderies in the United States and Territories. There are 1012 commanderies under the jurisdiction of the Grand Encampment, with a membership of 116,992. Subordinate commanderies in Delaware, Idaho, Nevada, New Mexico, Sandwich Islands, South Carolina, and Utah, with a membership of 1412, make a total membership of 118,404. Grand master, Reuben H. Lloyd, San Francisco, Cal.; grand recorder, William H. Mayo, St. Louis, Mo.

KNORR, ANGELO. See **SERUM THERAPY.**

KREMENTZ, PHILIPP, cardinal and archbishop of Cologne, died in Cologne May 6, 1899. He was born at Coblenz December 1, 1819; studied at Bonn and Munich, and was consecrated to the Roman Catholic priesthood at Treves in October, 1842. He then held positions in the church at Coblenz and Bedburg, and in 1849 again at Coblenz. In 1867 he was chosen bishop of Ermeland, and the next year was transferred to Frauenburg. In 1885 he succeeded P. Melcher as archbishop of Cologne, and was raised to the cardinalate in 1893. He wrote: *Das Haus Gottes*, 1854; *Die Stadt auf dem Berge oder Offenbarung und Abfall*, 1861; *Israel, Vorbild der Kirche*, 1865; *Das Evangelium im Buche Genesis*, 1867; *Das Leben Jesu, die Prophetie der Geschichte seiner Kirche*, 1869; *Grundlinien zur Geschichtstypik der Heiligen Schrift*, 1875; *Die Offenbarung des heil. Johannes im Licht des Evangeliums nach Johannes*, 1883.

KRUGER, STEPHEN JOHN PAUL, president of the South African Republic, was prominent in 1899 through his negotiations with the British colonial secretary, Mr. Joseph Chamberlain, previous to the outbreak of the Boer war. He was born in Rastenburg, Cape Colony, October 10, 1825. He went with the Boers into Natal, then into the Orange country, and when about fourteen years of age crossed the Vaal. In his early days he saw much adventure and hard fighting, and was one of the Boer leaders in the development of the country. Through courage and prudence he came to be highly regarded by the people, and in 1872 was made a member of the executive council. He became a general in the army, and in the war with England, memorable for the British defeat at Majuba Hill, February 27, 1881, he was commander-in-chief. He was chosen president of the republic in 1883, and has been retained in the position at every election since—1888, 1893, and 1898. He is considered a clever diplomat, and his negotiations with Mr. Chamberlain in 1899 were very creditable; exception, however, must be made to his "ultimatum," his communication of October 10, which it seems had the effect of precipitating the war. See **TRANSVAAL** (paragraphs on History).

LABOR. The subject of labor interests in this volume is treated in part in the articles *Strikes and Wages* (qq. v.), and in part in the articles on the different countries. The present article aims to summarize briefly the important features of labor legislation in the United States in 1899, and to discuss some of the points of interest in connection with the labor movement in this and foreign countries.

Labor Legislation in 1899.—In the review of State legislation for 1899, published by the New York State Library, the chief legislative enactments in regard to labor are grouped under the heads of labor bureaus, public employment agencies, factory inspection, the eight-hour day, and employers' liability. Many of the States have labor bureaus. No new ones were established in 1899, but several were reorganized or changed by the passage of new laws. In Idaho the Bureau of Immigration, Labor, and Statistics was reorganized, and the commissioner required to publish information concerning the State's resources in order to attract immigrants. Kansas also changed her system by creating a State society of labor whose secretary performs the duties of the former State commissioner of labor and the State factory inspector. The State of Massachusetts established a bureau of labor in 1869, and the federal government and many of the State governments have followed its example, but in the Western States the collection of labor statistics is still only a secondary duty on the part of already existing State organs. Public employment agencies have been established in a few of the States, but in general where the State concerns itself with this matter the practice is to provide for the regulation and licensing of private employment agencies. In 1899 Illinois established free employment agencies in cities of 50,000, and Missouri required the commissioner of labor statistics to establish such bureaus in cities of 100,000. Departments of factory inspection have been established in many of the States. In some cases the factory inspector presides over this department and in others the commissioner of labor. The tendency is to enlarge the duties of the factory inspector. In 1899 a New York law gave over to the factory inspector of the State several important duties which had been formerly left to the commissioner of police. Wisconsin increased the number of inspectors; Indiana and Tennessee created inspection departments, and Kansas, Idaho, Missouri, Colorado, South Dakota, Michigan, Alabama, and Arkansas provided for a more complete in-



PRESIDENT PAUL KRUEGER.

spection of the mines within the State. New York passed an important eight-hour law in 1899, providing that no laborer employed by public authorities or by contractors on public works shall be permitted to work more than eight hours a day, even though payment be offered for working overtime. Laws of California, Idaho, Washington, and West Virginia, passed in 1899, also established the eight-hour day for public works. Massachusetts established the eight-hour day for city and town employees. These laws generally provide for the payment of wages at the prevailing rate. In Indiana a law was passed in 1899 fixing the rate of unskilled labor on public works at not less than 15 cents an hour. Many laws exist limiting the hours of labor in occupations injurious to health. A new law was passed in 1899 in Nebraska prohibiting railway companies from permitting trainmen to work more than eighteen consecutive hours without eight hours' rest; in Wisconsin, prescribing the eight-hour day for persons under eighteen years of age in cigar factories; in Missouri, prescribing the hours of labor in bakeries and confectionery establishments; in Colorado, establishing the eight-hour day (except in emergency) in mines, smelters, and reduction works; and in Missouri, for miners working at a depth of 200 feet or more (except coal miners). The Colorado law was declared unconstitutional. In the United States the common law does not hold the employer responsible for an injury sustained by a workman through the negligence of a fellow-workman, but recent legislation has extended the liability of employers in many States, especially in the railway business. In 1899 North Dakota established the principle of employers' liability for injuries caused by the carelessness of a fellow-employee, and this liability may not be impaired by contract. Other important features of the year's legislation in regard to labor are noted in the *Bulletin* of the bureau of labor statistics of New York. Among them we may mention the following: Laws restricting the freedom of contract between employer and employee were passed in several of the States in 1899. For example, Connecticut, Idaho, and Wisconsin made it illegal for the employer to make non-membership in a labor organization a condition of employment; Colorado prohibited the use of the "truck system"; Kansas, Tennessee, Wisconsin, and Arkansas, and several other States framed certain regulations in regard to the method of paying employees; in Wisconsin a law required that any employer who demanded that his employees should give notice of intention to quit work under penalty of forfeiting wages should himself be liable to equal forfeiture for discharging employees without notice. The laws on the subject of employing women and minors were added to during the year. In New York the law was changed so as to apply to males under eighteen years of age, and to all females in prohibiting work for more than ten hours a day, and no children under sixteen were permitted to operate dangerous machines. Nebraska limited the hours of employment for females in manufacturing establishments, hotels, etc., to ten a day, and the same State, together with Florida, South Carolina, and Wisconsin, have followed the example of certain other States, which required that seats should be provided for female employees. Stricter regulations in regard to the employment of children to the extent of sacrificing their education were adopted in several of the States. The union label to mark goods as coming from factories where trade unionism prevails has frequently been counterfeited, and several States have passed laws to restrain the abuse. Laws on this subject were passed in 1899 by the legislatures of Arizona, Colorado, Delaware, Idaho, Wyoming, Georgia, and Illinois. The important matter of convict labor has led to much legislation for the purpose of preventing direct competition between it and free labor. Among the methods used to prevent such competition are the confinement of convict labor to industries not carried on within the State; the distribution of convict labor among many different industries, with a view to keeping down the product in each; the requirement that goods produced by convicts shall be taken only by State, county, and municipal institutions; the establishment of State prison plants in the West for the making of cordage and twine which have been the subject of monopolies. North Dakota and Kansas followed this policy in their legislation of 1899. In 1899 Idaho established a State board of arbitration whose decision is binding if both parties petition it to investigate and report, and it may investigate and report without petition. Illinois gave the State board of arbitration power to punish as for contempt of court persons refusing to give testimony or produce records, and Indiana extended the term of the labor commissioners and required them to offer mediation in all strikes. Formerly the mediation was to be offered only in strikes affecting fifty persons or more.

Compulsory Arbitration.—While the principle of compulsory arbitration is not generally favored by economists the example of New Zealand, where alone strictly compulsory arbitration has been established, has been in some respects encouraging. This system was established there by the act of 1894, and was amended in detail in 1895, 1896, and 1897. There are a general court of arbitration and local boards of conciliation. The colony is divided into industrial districts, each of which has a board of conciliation divided equally between representatives of the employers and

representatives of the employees. The general court of arbitration for the whole colony has three members who are appointed by the governor. In each district there is a clerk of awards who supervises elections to the boards of conciliation. In case of a dispute, application may be made to this officer by either party, and he refers it to the local board of conciliation. After trying to bring about an amicable arrangement the board of conciliation files its report with the clerk of awards. Either party may then carry the case up to the court of arbitration, whose award must be rendered within a month from the beginning of the hearing. The decisions of the local boards are not binding upon the parties, but the final awards of the court of arbitration are absolutely binding. In order to take part in the election of members of the local boards, employers' associations and the federation of trades unions must register with the registrar of the friendly societies of the colony. The trades unions generally favored the act, while the employers generally opposed it. In the spring of 1899, 132 associations of employers and workmen had registered. In the year 1897-98 twenty cases were brought up, and of these four were settled by the boards of conciliation and sixteen carried to the court of arbitration. The matters of controversy included all points at issue between capital and labor, and the system virtually amounts to giving to the court of arbitration the power of determining the conditions of labor for employers and employees. In many cases the court has fixed the rates of wages and the hours of labor for a period of two years. The system appears to have met with no obstacle in its practical operation and to have retained the favor of the working people. There have lately been signs that the employers were coming to approve it, especially on account of the greater stability which it introduced into their relations with workmen.

Eight-Hour Movement.—An important decision in the matter of the federal eight-hour law was made in 1899. This law, which was enacted August 1, 1892, provides that all employees on the public works of the United States or the District of Columbia shall be restricted to eight hours of work in any one calendar day, and the governments of the United States and the District of Columbia, or the contractors or sub-contractors who employ workmen, shall not require or permit any workman to work beyond that time, except in case of an emergency. The question that arose in 1899 was whether certain contractors on the government armory and boat-house at Annapolis were guilty of violating the statute. They pleaded that they were paying their workmen by the hour and not by the day. It was decided that payment by the hour did not relieve the defendants from the penalty of the law, and a considerable fine was imposed. The reduction of the hours of labor has been for a long time one of the main objects of labor organizations, as well as a conspicuous plank in the platform of the various socialistic parties. At the annual convention of the American Federation of Labor, in Detroit, in 1899, the declaration in favor of an eight-hour working day was made with great distinctness. The committee appointed to investigate the matter reported that in their opinion the introduction of the eight-hour day would do much to increase employment, lessen pauperism and crime, and enhance the consuming power of the people. They took issue with the assertion often made that workmen will produce as much in eight hours as in nine, and they held that the reduction in the output as a result of the shorter working day would yield beneficial results.

Labor in England.—In 1899 the labor department of the British Board of Trade published its annual report on wages and hours of labor for the year 1898. This clearly revealed the prosperous condition that prevailed in that year. It was reported that 1,003,290 working people had received increases of wages in the course of the year, and these statistics do not include agricultural laborers, seamen, and railway servants, who, however, appeared from many signs to have had their fair share in the general increase of wages. This increase was estimated at more than £95,000 a week as compared with a net increase of £45,000 a week in the previous year. The greatest advance was in the coal miners' wages, but there was also an increase in the metal, engineering, ship-building, and building trades. No very marked change in the hours of labor was reported for 1898. Ninety-five per cent. of the persons whose wages were increased in 1898 obtained the advance without having recourse to strikes. In 1899 the statistics showing the condition of co-operative societies in the United Kingdom for the previous year were published. The membership of these societies in 1898 was 1,500,000, the capital \$100,000,000, and the number of employees 44,000. It was reported that both distributive and productive co-operative societies were flourishing. The success of the English co-operative societies is attributed by some to the limitation of dividends and shares, which prevents the concentration of power in a few hands. The rate of interest is limited to 5 per cent., and the surplus profit divided among purchasers instead of being added to the dividends to shareholders. See TRADES UNIONS; also DENMARK; SOCIALISM; UNITED STATES, etc.

LABORI, FERNAND. See FRANCE (paragraphs on History).

LAHUAN. See BORNEO.

LACROSSE. The development of lacrosse in Canada, long the home of that pastime, has of late years been equalled in the United States. The strongest team in this country in 1899, as for several years past, was that of the Crescent Athletic Club, of Brooklyn, New York City. By the defeat of four strong Canadian teams—Toronto University, 11-8, Excelsior, 4-2, Montreal, 5-3, and Osgood Hall, Toronto, 11-3—the Crescent players won a fair title to the championship of Canada, and by the defeat of the nine other teams on their schedule, including the two intercollegiate champions, the Crescent men won the championship of the United States. The Crescent A. C. thus won its entire 13 games.

Intercollegiate lacrosse in this country is growing in favor, its more active representatives during 1899 including Cornell, Harvard, Columbia, Johns Hopkins, Lehigh, Stevens Institute of Technology, Hobart, and one or two others. Unfortunately, the sport lacks unity in its organization, there being two intercollegiate leagues, and in these not all the colleges having teams are represented. The Cornell-Harvard-Columbia league championship was won by Cornell, defeating Harvard 1-0, and Columbia 6-0. Cornell also twice defeated Hobart and tied with Stevens, 2-2. Its losing games with Crescent and Toronto were well played, and showed the development of the college game, the scores being 5-7 and 4-7 respectively. The Johns Hopkins-Lehigh-Stevens league championship was again won by Johns Hopkins, probably the strongest college team in the country. In this series Lehigh lost by 11-3, and Stevens 12-1. Johns Hopkins also defeated Harvard 20-0, and Columbia 9-1, and lost twice to Crescent by 3-5 and 1-12. The records of principal teams follows: Crescent A. C., 13 games, all won; Johns Hopkins, 4 won games out of 6; Stevens, 6 out of 9, and 1 drawn; Cornell, 4 out of 9, 2 drawn; Lehigh, 2 out of 6, 1 drawn; Columbia, 2 out of 7; Hobart, 1 out of 6; Harvard, 7 games lost.

LADRONES, or MARIANNE ISLANDS, a group of islands situated in the Pacific Ocean between 13° and 21° north latitude, and 145° and 146° east longitude, with an area of 417 square miles and a population estimated in 1887 at 10,172. The four principal islands of the group are Rota, Tinian, Saypan and Guam (*q. v.*); the last named with a population of about 9000, is the largest, and contains the principal town, Agaña, a place of about 3000 inhabitants. The group was discovered by Magellan in 1521, and had belonged to Spain, up to 1898, for 230 years. In 1898 Guam was ceded by Spain to the United States through the peace treaty of that year, and in February, 1899, the remainder of the Ladrone Islands, together with the Caroline and Pelew groups, comprising all the remaining Pacific possessions of Spain, were sold to Germany for 25,000,000 pesetas, or \$4,825,000. Formal announcement of the transfer was made in June. The purpose of Spain in ceding these islands was to rid herself of the comparatively unimportant appendages to the Philippines, Sulu and West Indian branches of her colonial empire which had been taken by the United States in 1898; the purpose of Germany in acquiring these small Spanish groups was declared to be the rounding off of the German possessions in the Pacific, and the further safeguarding of German commercial interests in that quarter of the globe. According to the clauses of the treaty transferring this territory, Germany concedes to the Spanish trade and agricultural enterprises in the islands the same treatment and facilities as conceded to German trade, and concedes to the Spanish religious orders in the islands the same rights and liberties as to the German orders; Spain will establish naval, mercantile, and coaling stations in the Caroline, Pelew, and Ladrone groups, and will be allowed to retain them in case of war. There was much criticism in the German press at the time of this purchase, the Radical and Socialistic sentiment being that the price paid was beyond the value of the islands. In the terms submitted to Spain by the United States at the close of the Spanish-American war, this country offered to buy a portion of the Caroline Islands from Spain, and there was some public sentiment in favor of buying the Caroline, Pelew, and Ladrone Islands entire. Spain, however, refused to sell to the United States even the islands which it was proposed by our government to buy in the Caroline group. The Ladrone Islands are divided into two groups, the northern of which is actively volcanic. The southern group has most of the population, and this is chiefly in the island of Guam; although the number of inhabitants in the entire group is probably greater than the estimate of 10,172, there are at the most not more than a few hundred settlers outside of the island belonging to this country. The natives are said to be allied to the Tagalos, in Luzon, and the smallness of their numbers is attributed to the wars waged by Spain. The original natives were Chamorros, and the present stock has resulted from the intermingling of these tribes with the Tagalos. Signs of an earlier civilization appear in the ruins of old temples and palaces, especially on the island of Tinian. The climate is said to be healthful and cooler than that of the Philippines. Agriculture and commerce are unimportant.

LAGOS is a British crown colony and protectorate on the western coast of Africa.

It includes the island of Lagos and a coast line and interior lying between French Dahomey and the British Nigeria protectorate. The area of the whole is about 1500 square miles, and the population is estimated at about 100,000. A recent unofficial British report speaks of Lagos as being a colony of great importance to England, since it contains the only safe harbor along a thousand miles of coast, and commands all the main routes to the populous interior. The town of Lagos, with a population of 35,000, is said to be the largest on the West African coast. The now famous Niger controversy of 1897-98, between France and Great Britain, affected the hinterland of Lagos, where the French were reported to be invading British territory. The discussion of this matter, together with the final settlement of the question, may be found under the articles Dahomey and Niger Territories. Notwithstanding the opinion quoted above as to the importance of Lagos to Great Britain as a key to future African commerce, the trade returns for 1897, as reported by publications of the United States Treasury Department, do not show a healthy condition of affairs. The imports of 1897, according to colonial returns, were valued at \$3,749,638, against \$4,386,863 in 1896. The chief decrease was in cotton and silk goods. There was also a decrease of 5157 gallons of spirits, but there was a large increase in the importation of tobacco, chiefly from Great Britain. The value of the exports, \$4,739,700 in 1896, was about \$3,946,000 in 1897. The production of rubber is decreasing, due to the reckless way in which the trees have been tapped. Some 4,458,000 pounds were shipped in 1897, against 6,484,000 pounds in 1896. A large falling off in palm oil exports is attributed to drouth. Coffee and cocoa are reported as being cultivated with success, and a new export has been found in mahogany, the value of which in 1897 was \$30,659. The activity of Great Britain in Lagos will undoubtedly before long again turn the direction of commerce toward a healthy growth. Under the Colonial Loans Act, 1899, an advance of about \$3,800,000 was made by the imperial government for the construction of a railway from Lagos to Abeokuta and Ibadan, and the survey of an extension to the Niger. The Niger territories, now under the Niger Company, will be taken over by the imperial government in 1900, and at this time the boundaries and coast line of Lagos may be extended.

LAKE REGULATIONS. See HARBOR IMPROVEMENTS.

LAMARCKISM. See ZOOLOGICAL LITERATURE (paragraph General Treatises).

LAMOUREUX, CHARLES, a well-known French musical conductor, died at Paris December 21, 1899. Lamoureux was born at Bordeaux in 1834. In 1848 he went to Paris to study under Girard and Chauvet at the Conservatoire. In 1854 he gained the first prize at the Conservatoire for violin playing, and he was a prominent player in the concerts there up to 1872. In 1875 his Société de l'Harmonie Sacrée performed the *Messiah* for the first time in Paris. From 1878 to 1881 he was director of the Paris Grand Opera, and he was made in 1880 a knight of the Legion of Honor. The Lamoureux Orchestra was founded in 1881. During the following decade Lamoureux introduced and popularized Wagner in Paris. He visited London with his orchestra in 1896 and 1897, meeting with great success.

LAMPMAN, ARCHIBALD, Canadian poet, born at Morpeth, Ontario, November 17, 1861, died at Ottawa February 10, 1899. He was graduated at Trinity College, Toronto, in 1882, and from the following year to the time of his death held a clerkship in the Post-office Department at Ottawa. He contributed occasionally to *Scribner's*, *Harper's*, and *The Century*, and published in 1888 *Among the Millet*, and *Other Poems*, and *Lyrics on Earth* in 1896.

LAMSON, CHARLES MARION, D.D., president of the American Board of Commissioners for Foreign Missions, died at St. Johnsbury, Vt., August 8, 1899. He was born at North Hadley, Mass., May 16, 1843, and was educated at Williston Seminary, Easthampton, and at Amherst College, being graduated at the latter in 1864. During the next two years he taught Latin and English at Amherst and then went abroad and studied theology at Halle. Having returned in 1868, he held pastorates in Congregational churches at Brockton and Worcester, Mass., St. Johnsbury, Vt., and Hartford, Conn. The last-named charge he held for the five years preceding his death. Upon the resignation in 1897 of Dr. Richard S. Storrs as president of the American Board of Commissioners for Foreign Missions, Dr. Lamson was elected to the position. During his term of office he did much by his wise counsel and tolerant and sympathetic bearing to allay the spirit of controversy that a short time before had been so active in the Board. Upon his death it was said: "The Congregational denomination loses one of its ablest ministers in the fullest prime of his strength, the American Board loses its president, and the American Church loses one who was peer with its best and wisest leaders." Dr. Lamson was a member of the American Antiquarian Society, and a trustee of Amherst College.

LANDS, PUBLIC. The policy of the United States in regard to its public domain is one of the most enlightened in the world. It may be said that few civilized

governments have found themselves in possession of such vast tracts of land as have come under the public control of this nation from its very beginning. In addition to the reaches of land, extending to the Mississippi, which were possessed by the original colonies, the government has found itself in control of wide stretches of territory added successively by the Louisiana purchase, the Spanish cession of Florida, the Texan annexation, and the Mexican cessions, and the purchase of Alaska from Russia. Thus the United States government has had altogether under its control the disposal of over two-thirds of the national territory, stretching from Ohio to the Pacific Ocean, aggregating, exclusive of Alaska, over two and a half million square miles, or over 1,220,000,000 acres. The whole of this area has now been erected into States and Territories, but a large amount of public land, scattered through some twenty-five or more States (including four Territories), still remains the property of the general government. The total area of public land vacant and unappropriated on July 1, 1899, was 569,815,308 acres, excluding Alaska, and 144,219,233 acres reserved. The entire amount of public land in Illinois, Indiana, Iowa, and Ohio has been appropriated, thus leaving but eight States not in the Far West in which the public domain is unappropriated. These States are Minnesota, with 5,627,394 acres unreserved; Michigan, 473,013 acres; Wisconsin, 374,243 acres; Missouri, 449,029; Mississippi, 285,730; Alabama, 428,883; Louisiana, 593,080 acres, and the State of Florida, in which 1,600,428 acres are still unappropriated.

The policy of the government is well settled that the public lands are for the benefit of the people. The Homestead act, operative in the West, by which the principle of free grants to individuals was adopted, has not only provided opportunity to those who had intent to settle and found homes, but has induced emigration to uninhabited portions of the country. This and the discovery of gold in California have greatly stimulated the remarkable development of the West in the last half century. But in the encouragement of education and the building of railroads, the management of the public land has also played an important part. In addition, the concession for the right of way for irrigation and like purposes has been found to have been of such national benefit that a premium has been placed on the reclamation of the so-called desert lands of the West, and provisions made within the last five years for the donation to each of the States in which there may be situated desert lands of not more than 1,000,000 acres of such land as the State may cause to be irrigated and reclaimed, without regard to cultivation or settlement. In connection with the management of its public lands the United States has also maintained a system of public survey upon which it annually spends a large amount of money.

Agricultural and Mineral Lands.—During the fiscal year ending June 30, 1899, the disposal of public lands amounted to 9,182,413 acres, an increase of 728,516 acres over the aggregate of disposals in the previous year. Patents of the class denominated agricultural—that is to say, patents issued on final and commuted homestead entries, on desert land, timber culture, pre-emption, private cash, town-site, and other entries of an agricultural, non-mineral character—were issued during the fiscal year to the number of 34,407. These patents embraced approximately 5,500,000 acres. Other patents granted include: Mineral and mill-site, 1712 grants; coal, 3883 acres; under railroad grants, 504,651 acres; under wagon-road grants, 60,392 acres; Indian and miscellaneous patents, 212,849 acres; swamp-lands, 150,541 acres; educational grants, etc., 420,760 acres. The military-bounty land warrants located during the year in the several States and Territories represent an aggregate of 9760 acres. The more important of the above patents discussed by the United States commissioner of the General Land Office in his last report were the homestead and railroad grants, desert irrigation, and mineral land grants. There has been a decrease of over 50 per cent. in the acreage patented this year under the land grants authorized by Congress to aid in the construction of railroads. The number of acres patented in the preceding year were 1,032,535. In the adjustments of railroad grants the most important examinations during the past year have been those concerning the Northern Pacific, the Union Pacific, the St. Paul, Minneapolis and Manitoba, and the Southern Pacific Railroads. In a suit brought against the last-named company about 1,000,000 acres of land were recovered and opened to entry. Supplemental proceedings involving a portion of these lands, which have been sold by the company, are pending in the courts, and also three suits involving lands within its main and branch lines aggregating about 2,300,000 acres. A complete adjustment of the grants of the Northern Pacific Railroad shows that that company is entitled to 36,570,100 acres, of which there is still due from the United States 14,851,832 acres. The whole area of the grant to the Union Pacific Railroad is found to be 12,129,842 acres, of which there is still due to the company 5,153,646 acres. As there are large unsurveyed tracts within the limits of both the said grants, some difficulties are expected to arise upon the final adjustments. The adjustments of the grants to the St. Paul, Minneapolis and Manitoba Company for its main and branch lines shows the area of the grant for the main line to be 1,287,228 acres, or an excess of 10,975 acres. For the branch lines the company

hasthus far received an acreage less than that granted, and a net balance of indemnity of 55,587 acres is held against the company. Right of way to five railroads has been given through public lands during the year, and 45 companies or individuals have been given right of way for irrigating or water-transportation canals or reservoirs. Under the State Desert Segregation act, ceding irrigated public lands to the State in cases where the State has performed the work, the State of Montana has filed three lists, aggregating 50,201 acres, which have been approved, and a list involving 160 acres has been approved for the State of Wyoming. For the mineral division, the Land Office reports that the mineral and mill-site patents issued for the year were exceeded in number only in 1883, 1891, and 1892, and the number of mining claims patented, 3853, is greater than in any other year except 1892. There are no reliable data at hand from which to estimate the amount of gold taken from the Yukon country in Alaska; no mining claims have been received from that Territory, but United States land offices have now been opened at Circle City and Peavy, and another year will disclose whether or not the miners in that district are desirous of proving up, paying for, and acquiring title to their claims. The localities in the United States showing the greatest activity in the mining industry are principally the Cripple Creek district, Boulder, Clear Creek, and Gilpin Counties, the Leadville district, and upper San Miguel County, all in Colorado; Jefferson, Silver Bow, and Deer Lodge Counties, Mont.; Lawrence County, S. D.; Colville Indian Reservation, Wash.; Salt Lake and Tooele Counties, Utah; Eldorado and Calaveras Counties, Cal.; and Shoshone and Boise Counties, Idaho.

The following table shows the number of mineral and mill-site patents issued for each fiscal year, commencing with the fiscal year ending June 30, 1869, in which the first patent under the United States mining laws was issued:

Year.	Patents.	Year.	Patents.	Year.	Patents.	Year.	Patents.
1869.....	24	1877.....	514	1885.....	510	1893.....	1,498
1870.....	111	1878.....	543	1886.....	675	1894.....	1,363
1871.....	104	1879.....	348	1887.....	1,459	1895.....	1,242
1872.....	138	1880.....	966	1888.....	1,064	1896.....	1,476
1873.....	218	1881.....	727	1889.....	918	1897.....	1,665
1874.....	305	1882.....	1,296	1890.....	1,407	1898.....	1,859
1875.....	428	1883.....	1,75	1891.....	1,790	1899.....	1,712
1876.....	443	1884.....	1,661	1892.....	3,963		

The Public Forests.—The principle that the State ownership of public lands is for the public benefit has been applied to the agricultural lands as a benefit to the individual, the national benefit accruing therefrom being incidental. In the management of the forest lands, however, the social welfare of the community chiefly is regarded. The policy of holding the forests covering important watersheds or retaining them for the purpose of preserving the timber supply, which is diminishing at an alarming rate, has not until recent years received the attention which it deserves, and the United States is still far behind most European countries in this respect. The practice of disposing of large portions of forest land is no longer carried on, however, to the extent to which it once prevailed. Within the past nine years 37 forest reservations have been created, embracing an estimated area of 46,021,899 acres. There are under consideration also nearly fifty proposed new reserves. The principal revenue now accruing to the government from its woodlands are from the granting of privileges for timbering operations. The latter privilege, when carried out under competent supervision, can work little danger to the present timber supply. It is by the method of State supervision and the replanting of forests that much of the timber is obtained in the large European countries, where forestry has reached a high point of development and attained the status of a profession. The forest service of the United States, even in its present early stage of development, has already proved largely self-supporting. No less important, however, than the preservation of the timber supply, and of even more importance than a large revenue, is the conservation of water at the head springs of our rivers. It is the opinion of the commissioner of the General Land Office that those reserves created to retain needed water supplies should have the forests which they contain left absolutely untouched. When it is considered that it takes from three to five centuries, according to the official report, to make one foot in depth of the humus soil which constitutes the floor of a virgin forest, it does not seem too much to ask that woodland, where original, shall be preserved. This humus soil is the best water reservoir known, soaking up the rainfall like a sponge and transferring it gradually to the springs and feeders of the rivers. When a forest has been cut over and the sunlight admitted, this soil becomes as dry

as tinder and especially subject to fire. Once ignited it burns fiercely, and is often consumed down to the solid rock, and it never returns. The average annual loss from fire already reaches \$20,000,000.

During 1899 the effect of the widespread interest in forest questions has been shown by the enlargement of two of the existing forest reservations, and the establishment of six additional reserves with a combined area of over 5,200,000 acres. The reservations known as the San Francisco Mountains and the Black Mesa Forest Reserves were created in the Territory of Arizona for the conservation of important water supplies. The Gila River Reserve, established about the headwaters and various tributaries of the Gila, San Francisco, Tularosa, and Mimbres Rivers, in New Mexico, will benefit not only that Territory, but the entire southern portion of Arizona, which is dependent upon the Gila River as the one great stream of that arid region. A petition by the Utah legislature for a public park in the vicinity of Fish Lake resulted in the creation of the Fish Lake Forest Reserve, as better serving the interests of the State while the Gallatin Reserves in Montana originated in a request from the Montana College of Agriculture and Mechanic Arts for lands dedicated to experimental work along irrigation and forestry lines. The Lake Tahoe Reserve in California was the result of petitions from the Leland Stanford and California Universities and the Sierra Club, and a petition from Nevada signed by the governor and a number of other State officials. The territory which it was asked should be set aside as a public park contains scenic features of the finest possible description. An area adjoining Lake Tahoe was set aside as a forest reserve embracing the country recommended.

One of the most important measures taken during 1899 was the action of Congress in withdrawing from the Mount Rainier Forest Reserve a portion of the region immediately surrounding Mount Rainier, and setting it aside as a national park. The peculiar features of this region, according to the land commissioner's report, demand different and more stringent protection than that afforded a forest reservation. The forests that clothe the slope and foothills of Mount Rainier require, as great regulators of floods, to be preserved absolutely untouched, while the protection of arctic animals present in that region calls for extraordinary measures. The necessity of having this unique park and its environs preserved in a state of nature has for years attracted much attention, not only in this country but abroad, and the matter of setting it apart as a national park has long been one of international interest, eminent scientists of England and Germany being among the promoters of the move. The scientific reasons which aided in the adoption of the measure by Congress were set forth in the following memorial to the United States Senate:

"Mount Tacoma (Mount Rainier) is single not merely because it is superbly majestic; it is an arctic island in a temperate zone. In a bygone age an arctic climate prevailed over the Northwest, and glaciers covered the Cascade Range. Arctic animals and arctic plants then lived throughout the region. . . . On the great peak the glaciers linger still. They give to it its greatest beauty. They are themselves magnificent, and with them survives a colony of arctic animals and plants which can not exist in the temperate climate of the less lofty mountains. These arctic forms are as effectually isolated as shipwrecked sailors on an island in midocean. There is no refuge for them beyond their haunts on ice-bound cliffs. But even there the birds and animals are no longer safe from the keen sportsmen, and the few survivors must soon be exterminated unless protected by the government in a national park."

The General Land Office endorses the recommendations of members of the Geological Survey that the limits of this important park be increased to influence districts whose scenic aspects are essential to the unity of the park, and whose features should come under park protection. Additional reserves of heavy timber should in this particular case be protected from those operations of lumbermen which it is part of the general economic policy of the forest reserve commission to a certain extent to promote. The extension of the Yellowstone Park is also recommended by the incorporation of a portion of the Teton forest reserve and the Yellowstone timber-land reserve. It is desired to throw additional safeguards about the big game, which is found to winter largely in these outlying reserves, and to protect more effectually the timber embraced in those reserves. Park game-protection does not extend to the forest reserves proper, which are under the State game laws, and open for hunting in season. For the forest patrol it was recommended that a body of regular troops should be employed. "The superior discipline of regular troops makes a more effective patrol than the civil forest officers, and cavalry can cover a greater extent of territory with more expedition and is better able to cope than are forest rangers."

The fact that all of the thirty-seven public forest reservations, embracing an estimated area of 46,021,899 acres, have been created since 1891, or within nine years, furnishes sufficient comment on the advance which the United States has made in the management of this important department of its public domain. These reservations are shown in the following table:

State or Territory.	Name of Reservation.	Date of Proclamation Creating Reservations.	Present Estimated Area in Acres.
Alaska	Afognak Forest and Fish Culture Reserve. (Reserved under Secs. 24 and 14, Act Mar. 3, 1891.)	Dec. 24, 1892	Not ascer- tained.
Arizona	Grand Canyon Forest Reserve	Feb. 20, 1892	1,851,580
	San Francisco Mountains Forest Reserve	Aug. 17, 1893	975,360
	Black Mesa Forest Reserve	do	1,658,890
California	The Prescott Forest Reserve	May 10, 1893	10,240
	San Gabriel Timber Land Reserve	Dec. 20, 1893	535,520
	Sierra Forest Reserve	Feb. 14, 1893	4,096,000
	San Bernardino Forest Reserve	Feb. 25, 1893	737,360
	Trabuco Canyon Forest Reserve	do	109,920
	The Stanislaus Forest Reserve	Jan. 20, 1893	691,900
	The San Jacinto Forest Reserve	Feb. 22, 1897	737,360
	The Pine Mountain and Zaca Lake Forest Reserve	do	1,644,594
Colorado	Lake Tahoe Forest Reserve	Mar. 2, 1893	126,835
	White River Plateau Timber Land Reserve	Apr. 13, 1893	1,198,090
	Pikes Peak Timber Land Reserve	Oct. 16, 1891	184,320
	Pium Creek Timber Land Reserve	Feb. 11, 1893	179,200
	The South Platte Forest Reserve	Mar. 15, 1893	668,520
	Battlement Mesa Forest Reserve	June 23, 1893	658,240
Idaho and Montana	The Bitter Root Forest Reserve	Dec. 9, 1893	4,147,900
Idaho and Washington	The Priest River Forest Reserve	Feb. 22, 1897	645,180
Montana	The Flathead Forest Reserve	do	1,892,406
	The Lewis and Clarke Forest Reserve	do	2,828,080
	Gallatin Forest Reserve	Feb. 10, 1899	*40,380
New Mexico	The Pecos River Forest Reserve	Jan. 11, 1892	431,040
	Gila River Forest Reserve	May 27, 1893	2,327,040
Oregon	Bull Run Timber Land Reserve	Mar. 2, 1890	143,080
	The Cascade Range Forest Reserve	June 17, 1893	4,492,800
	Ashland Forest Reserve	Sept. 25, 1893	18,560
South Dakota and Wy- oming	The Black Hills Forest Reserve	do	1,311,680
Utah	The Uintah Forest Reserve	Feb. 22, 1897	878,520
	Fish Lake Forest Reserve	Sept. 19, 1893	67,840
Washington	The Washington Forest Reserve	Feb. 22, 1897	2,894,240
	The Olympic Forest Reserve	Feb. 10, 1899	2,128,800
	The Mount Rainier Forest Reserve. (Area re- duced Mar. 2, 1899, by Act of Congress creating the Mount Rainier National Park (30 Stat. 993).)	do	2,087,520
Wyoming	Yellowstone National Park Timber Land Re- serve	Mar. 30, 1891	1,239,040
	The Big Horn Forest Reserve	Sept. 10, 1891	1,127,680
	The Teton Forest Reserve	Feb. 22, 1897	829,440

* Even sections only.

While the benefits derived from a national forestry system in the way of forest preservation and water conservation are necessarily beyond computation, one of the minor advantages—namely, a revenue to the government—is appreciable; the receipts from this source, according to the report of the general land commissioner, were for the past year, \$223,696.56. As the amount expended in connection with public timber was but \$285,000, it is evident that the service is already nearly self-supporting. With the continuance of education in forestry matters, and with proper legislation, the administration of our forest lands can, in the opinion of the commissioner, be made to yield a large revenue.

A patrol of 9 superintendents, 37 supervisors, and 250 rangers served on the reserves from July 1 to October 15, 1899. During the season of 1900, 100 additional rangers will be employed. There were extinguished 749 small fires, 223 considerable fires, and 9 large and important fires, involving a vast saving to timber regions. The total area burned (mostly State forests) was 131,586 acres, and the extra cost of fire service was \$11,887.75. In consideration of new and proposed reserves the sum of \$300,000 for the expenses of the forest service is asked for the year of 1900-01, as against \$175,000 granted for the year 1899-1900. See FORESTRY.

LATTER DAY SAINTS. See MORMONS.

LAWRENCE, WILLIAM, LL.D. jurist and ex-comptroller of the United States Treasury, died at Bellefontaine, O., May 3, 1899. He was born June 26, 1819, at Mount Pleasant, O.; was graduated at Franklin College, New Athens, in 1838, and at the Cincinnati Law School two years later, when he was admitted to the bar. In 1845-47 he edited at Bellefontaine the *Logan Gazette*, and later became one of the editors of the *Western Law Monthly*. He was a member of the lower house of the

Ohio legislature in 1846-48, and of the Senate in 1849, 1850, and 1854. While in the legislature he brought about the establishment of a reform school, and secured the passage of a free-banking law. From 1857 to 1864 he was judge of the Court of Common Pleas and of the District Court. In 1862 he was in the Union service as colonel of the Eighty-fourth Ohio Volunteers, and was at Cumberland and New Creek. Judge Lawrence was a Republican representative in Congress from 1865 to 1877, serving through the Forty-fourth Congress. In 1880 he was appointed first comptroller of the United States Treasury, and resigned this position five years later. He was a prominent member in the Methodist Episcopal Church. Besides a number of important legal works, he wrote much in favor of a protective tariff. Among his publications are: *Ohio Reports*, Vol. XX.; *Organization of the Treasury Department*; *Law of Claims Against Governments*; *Law of Impeachable Crimes*; *Causes of the Rebellion*; *Life and Services of John Sherman*; *Decisions of the First Comptroller*, 6 vols.; *Law of Religious Societies*; *The American Wool Interest*; *Memorials to Congress for Wool Tariff*, 10 vols.; *The Treaty Question*; *Constitutional Law*.

LAWTON, HENRY W., major-general, U. S. V., was shot and killed in an attack upon intrenched Filipinos at San Mateo, Luzon, December 19, 1899. He was the first general killed since the outbreak of war in April, 1898. His rank in the regular army was colonel and inspector-general of volunteers, but his nomination for brigadier-general, U. S. A., was determined upon and was ready to be sent to the Senate on the day of his death. General Lawton had a long and honorable career as a soldier. He was born March 17, 1843, at Manhattan, now a part of Toledo, O. On April 18, 1861, he enlisted as sergeant of Company E, Ninth Indiana Infantry, and on July 29 of the same year was mustered out; on the 20th of the next month he entered, as a first lieutenant, the Thirtieth Indiana Regiment, with which he served to the end of the war. This regiment was a part of the Army of the Tennessee. Lawton was promoted to the rank of lieutenant-colonel, was brevetted colonel, and at the same time was awarded a medal of honor for distinguished gallantry at Atlanta on August 3, 1864. Among the battles in which he took part were Shiloh, Corinth, Chickamauga, Stone's River, Rocky Face, Resaca, Dallas, Kenesaw Mountain, Lovejoy's Station, Franklin, and Nashville. During the war his regiment lost 137 officers and men killed and 275 died of disease, or 412 deaths out of a total enrollment of 1126. On November 26, 1865, Lawton was mustered out, and was recommended for a commission in the regular army by General Sherman, General Sheridan, and General J. T. Wood. This commission he received on July 28, 1866, when he was assigned to the Forty-first Infantry as a second lieutenant. As a first lieutenant in the Fourth Cavalry he gained his fame as an Indian fighter. He served in the Southwest, especially in Arizona, until 1888, participating in some of the hardest Indian campaigns in the history of that part of the country. On March 20, 1879, he was promoted to a captaincy, and it was while holding this rank that he conducted his famous campaign, under the direction of General Miles, against Geronimo, the half-breed Apache leader. This campaign marked the close of Lawton's Indian fighting, for on the 17th of September, 1886, he was made inspector-general with the rank of major—a very desirable staff position. On February 12, 1889, he became a lieutenant-colonel, which grade he held at the beginning of the war with Spain. Lawton was commissioned a brigadier-general of volunteers on May 4, 1898, and in the following month went to Cuba with the army of invasion (Fifth Corps) under General William R. Shafter. He was placed in command of the second division, which took El Caney in the battle of Santiago, July 1, 1898, and on the 7th of the month was made a colonel in the regular establishment, and on the following day a major-general of volunteers. He subsequently commanded the department of Santiago and the Fourth Army Corps. On December 29, 1898, General Lawton was ordered to the Philippines as second in command to General Otis. Having reached Manila March 10, he took command on the 18th of the first division of the Eighth Army Corps. He captured Santa Cruz on April 10, took San Isidro later, and on June 1 assumed command of the lines in Morong province about Manila. He had made his expedition through Laguna de Bay and Bulacan province, having engaged in 22 fights and captured 28 towns. He was next engaged south of Manila, and met with strong opposition, the principal fight being known as that of Zapoti Bridge, June 13. In October he began operations again against the insurgents in the north, and after achieving much success returned to Manila early in December. His last expedition was to take San Mateo, where a small number of the already disintegrated Filipino forces had gathered. In the official announcement of General Lawton's death Secretary of War Root said: "The swift and resistless movement of his column up the Rio Grande and across the northern boundary of the plain of central Luzon, which had just been completed, was the chief factor in the destruction of the insurgent power, and was the crowning achievement of his ardu-

ous life. He fell in the fulness of his powers, in the joy of conflict, in the consciousness of assured victory."

LEAD. The output in 1898 in the United States was 235,573 short tons. It was obtained chiefly from the argentiferous lead ores of Colorado, Idaho, Utah, and Montana, but large quantities were also yielded by the lead and zinc ores of the Mississippi Valley. The total amount of lead refined in the United States in 1898 is estimated at 335,342 short tons. About 84,666 short tons of this were refined in bond and exported, and about 1200 short tons exported in manufactures. The production for 1899 may be somewhat lower than that of 1898, owing to strikes at the Colorado lead-silver smelters.

Messrs. Iles and Shelby have pointed out that the decomposition of the slag dumps at some lead smelters has yielded an efflorescence rich in potash and sodium sulphates, and they suggest that perhaps these may be made to serve as a source of potash.

LEAD POISONING. Medical examination of the employees in potteries in England and medical agitation of the conditions found have been instrumental in securing recent legislation, the effect of which will be to protect such employees from exposure to lead poisoning. Women and children have heretofore been frequent sufferers from this form of toxication. The British Home Office has announced that all workers in lead hereafter are to be subjected to periodical medical examination. Attempts to discourage the use of lead glazes have been made by relaxing some of the special rules of the Factory acts in favor of manufactories where leadless glazes are used. As it is claimed that lead glazes are in no way superior to other glazes, it is confidently predicted that a great industry, hitherto fraught with constant danger to the hands employed, will become comparatively safe through the abandonment of the use of lead. See **WATER-WORKS**.

LEAGUE OF AMERICAN MUNICIPALITIES, established in 1897, had in 1899 a membership of 7000. The objects are to improve municipal administration by organizing study of practical questions, by holding annual conventions, and by maintaining a bureau of information concerning municipal affairs. The meeting for 1900 is to be in Charleston, S. C. Secretary, B. F. Gilkison, 111 Nassau Street, New York City.

LEAGUE OF AMERICAN WHEELMEN, organized in 1880, in 1899 had 50,728 members. General meeting of members for 1900 at Milwaukee, July 10 to 15. Secretary, Abbot Basset, 530 Atlantic Avenue, Boston, Mass.

LEEWARD ISLANDS, a group of the Lesser Antilles, lying to the southeast of Puerto Rico and north of the Windward Islands, constitute a colony of Great Britain. They have a total area of 701 square miles; the population in 1891 was 127,723, an increase of 5000 in a decade. The group comprises Dominica (area 291 square miles; population 26,841), Antigua (area 108; population, with the small islands Barbuda and Redonda, 36,819), St. Kitts (area 65; population 30,876), Nevis (area 50; population 13,087), Montserrat (area 32; population 11,762), the Virgin Islands, and Anguilla. The chief towns are St. John, Antigua, population about 9800, and Basseterre, St. Kitts, population about 9100. Nearly four-fifths of the population are negroes; the whites number about 5100, and the remainder are mulattoes. For administrative purposes the islands are divided into five presidencies; Antigua is the seat of government; the governor and commander-in-chief since 1895 has been Sir Francis Fleming, K.C.M.G. Education is denominational, and there are private schools and schools receiving government aid. The religious bodies in the order of their numerical strength are Anglicans, Wesleyans, Roman Catholics, and Moravians. The chief products are sugar, coffee, cocoa, and fruits. The public debt in 1898 was £300,121. Other statistics of finance and statistics of commerce have been:

	Revenue.	Expenditure.	Imports.	Exports.
1897.....	£124,767	£140,944	£325,653	£331,534
1898.....	112,577	138,612	299,973	286,403

The sugar export in 1897 was valued at £236,209; the leading imports for that year were flour, £47,000, and cottons, £23,308.

On August 7, 1899, the hurricane which swept over the Lesser Antilles and other parts of the West Indies, especially Puerto Rico, devastated Montserrat, and did damage also in St. Kitts, Nevis, and Antigua. Many persons lost their lives and many more were injured.

LEGION OF HONOR, founded by Napoleon in 1802, as a reward for military and civil services, in 1899 had 52 grand crosses, 210 grand officers, 1027 commanders, 5679 officers, and 36,170 chevaliers. Two American women are said to possess the decoration of the French Legion of Honor. Military members receive from 500 to

3000 francs a year, according to rank. The grand master of the order is the president of the French Republic.

LEITNER, GOTTLIEB WILLIAM, PH.D., oriental linguist, died at Bonn, Germany, March 24, 1899. He was born at Pesth, Hungary, October 14, 1830. His father, a German physician, having become involved in the revolution of 1849, went to Turkey. Here Gottlieb, already a good classical scholar, learned Turkish, Arabic, and modern Greek. Later he learned English, French, and Italian at the British College in Malta. He went to London, where he was naturalized as a British subject, and studied at King's College; in this institution he became in 1859 teacher of Arabic, Turkish, and modern Greek, and two years later was made professor of Arabic. He also taught Mohammedan law. In 1864 he was appointed director of the college at Lahore in the Punjab; he did excellent work in that country in establishing schools, societies, newspapers, and libraries, and in introducing reforms in the existing educational institutions. Under the commission of the government of the Punjab he made explorations in Kashmir, Ladakh, Thibet, and Dardistan; his research was made especially notable by his discovery that the Dardu languages are allied to Sanskrit. He also found in a certain tribe Graeco-Buddhist sculptures, from which he surmised that the people were descendants of Macedonians who had settled there in the time of Alexander the Great. Leitner extended his philological study to the languages of other districts, including Kabul and Badakhshan, and sent to the Vienna exposition an extensive collection of Central Asiatic antiquities. Among his works, besides many contributions to the collections of learned societies in England and on the continent, may be mentioned: *Theory and Practice of Education*; *Philosophical Grammar of Arabic*, in the English, Arabic, and Urdu languages; *The Sinin-i-Islam*, a history of the Mohammedan religion in its relation to general history; *The Races of Turkey*; *Graeco-Buddhist Discoveries*; *A Comparative Grammar of the Dardu Languages*; *History, Songs, and Legends of Dardistan*; *Kafiristan*; *History of Indigenous Education in the Punjab since Annexation*.

LEO XIII, POPE, addressed to Cardinal Gibbons, under date of January 22, 1899, a letter which was practically an encyclical to Roman Catholics in America. The subject of the letter was the so-called "Americanism" in the church, special reference being made to Father Elliott's biography of Father Hecker, the founder of the Paulist order, who died in New York in December, 1888. The Pope pointed out in what "Americanism" is inconsistent with the Church and in what it is not, and while admitting the importance of modern thought and progress, warned American Catholics against a failure to recognize the authority of the Romish discipline and dogma. The letter was answered by Archbishop Keane, Archbishop Ireland, the Paulist Fathers, and other Catholics, all of whom repudiated "all the opinions the Apostolic letter repudiates and condemns." *Apropos* of The Hague Conference, the Holy See was the subject of some discussion; it was urged in some quarters that an invitation be issued to the Vatican for representation at the conference, but this was opposed by the Italian government, and it was finally decided that the Pope receive no official recognition. In 1899 Pope Leo underwent a serious operation, from which, it is said, he has only partially recovered. For many years his physical and mental strength has been most remarkable. He is the son of Count Ludovico Pecchi, and was born at Carpineto, March 2, 1810.

LEONARD, MOSES GAGE, sometime member of Congress, died at his home in Brooklyn, N. Y., March 20, 1899. He was born in Stafford, Conn., July 10, 1809; came to New York City in 1832, and engaged in business. He became an alderman in 1840, and held office for three years. In 1844 he was elected as a Democrat to the Twenty-seventh Congress; he was renominated for the next Congress, but defeated. From 1846 to 1849 he performed important services as commissioner of charities and alms. In the latter year he went to San Francisco, where he was a member of the first common council, but in 1851 returned to New York. Upon the outbreak of the Civil War he was prominent in raising troops, and was one of the organizers of the One Hundred and Thirty-fifth New York Regiment, afterward the Sixth Artillery Regiment. Up to 1860 Leonard was a Democrat; after that he voted with the Republicans until 1884, when he supported Mr. Cleveland.

LEOPOLD II. See CONGO FREE STATE.

LEPROSY. The report of Surgeon Kinyoun, the delegate from the United States to the International Leprosy Conference in Berlin in 1897, was published in December, 1899. At the conference Besnier estimated the number of lepers in the world at 180,000, and credited the United States with possessing 250. Our true number is probably greater. The conference reached the following conclusions: (1) That the *Bacillus lepræ* is the sole cause of leprosy; (2) that every leper is a menace to those about him; (3) that the disease attacks all classes; (4) that the disease is not hereditary; (5) that all cases of leprosy should be reported in obedience to statute; (6) that isolation in some form is desirable. Dr. R. S. Wood-

son, of the United States Army, reports the great improvement of a case of leprosy during treatment with Calmette's antivenene serum from August to October, 1899. The case occurred in a woman, and was of the tubercular-anæsthetic form. His description of her appearance and condition at the time treatment was begun is as follows: "A large, raw-boned woman of 'scrawny' type, aged 36, but apparently 48; weight, 131; hunted, downcast look; huskiness of face, with marked telangiectasis extending over nose, cheeks, chin, and ears; nasal septum destroyed; nose lobulated and sunken in; infiltration of sides of nose extending into cheeks; supraorbital infiltration a symptom-complex, giving the leonine expression of countenance; right ear leathery, pendulous, and thickened; edema of the feet and legs, several small ulcers on each leg; numerous scars of past lesions; voice harsh and strident; stiffened fingers; anæsthesia absolute along the ulnar tract, but sensation diminished over entire surface of arms, chest, and back; very much mottled from former lesions; several small nodules along the dorsum of each hand and on each forearm; marked muscular atrophy of both arms; abundant nasal secretion; frequent bleeding from venules on surface of nose; mental condition good, except for moments of violent rage on slight provocation.

"The patient stated that she was afflicted with the habit of frequently dropping objects held in her grasp; that her sense of touch was so deficient that she would need ocular demonstration of the fact that she held the object in her grasp; also that of late she could not feel the bite of insects (mosquitoes) on any portion of her body. I enucleated a tubercle from the back of her hand about the size of a pea; she gave no evidence of pain during the operation."

Marked improvement resulted from the treatment, which was discontinued because of the failure of the supply of serum. The patient was receiving large doses of *hoang nan* at the same time. The improvement of the patient is thus described by Dr. Woodson: "The present condition of the patient is one of great improvement. She has lost the leprous expression. The supraorbital infiltration has disappeared. The infiltration on each side of nose and that over each cheek has diminished perceptibly; in fact, all over her face and ears there is a marked loss of infiltration.

"The bluish color of her face has changed to a healthy red. The telangiectasis has diminished. Her eyes are clear and bright. There are no sores on any portion of her body. There is only one tubercle remaining (the one mentioned above on left side, level of fifth rib); this has proved somewhat obstinate, despite frequent local injections. Her anæsthesia has disappeared, so that the injections have become extremely painful, even along the ulnar tract. Her skin has become softer and fairer. Her chest and back have particularly improved, having filled out with healthy tissue, and all lesions have disappeared. Her nasal discharge has ceased. Her voice is natural, and her fingers have lost their stiffness. She has gained 14 pounds in weight in 145 pounds. Her general health is excellent."

Dr. Woodson was led to make the experiment of treating this case with antivenene by the success of similar treatment of five cases of leprosy by Dr. Isidore Dyer, of New Orleans. The latter physician reported two cured, two markedly improved, and one, occurring in an aged and frail patient, unimproved. Dr. Dyer, in turn, conceived the idea of this treatment after witnessing the remarkable amelioration of symptoms in a tubercular leper who was bitten by a venomous serpent in 1897.

Calmette's antivenene is made from snake venom which has been transmitted through many individuals, and thus modified and attenuated. It is not a true antitoxin. *Hoang nan* is the bark of *Strychnos gaultheriana*. It contains the alkaloids found in *nux vomica*—namely, strychnia and brucia. It is much used in Indo-China in leprosy, rabies, scrofula, and paralysis, and is also used in Paris. See INSECTS AND THE PROPAGATION OF DISEASES.

LEYDS, WILLIAM JOHANNES, foreign agent of the South African Republic since 1898, was born at Magelang, Java, in 1859, and was educated at Amsterdam University, where he received the degree of doctor at law. In 1884 he was made attorney-general of the South African Republic, and four years later was made state secretary. To this position he was re-elected in 1893 and 1897. In 1889 he was justice of peace for the entire republic. During 1899 Dr. Leyds endeavored to arouse sympathy and gain assistance in Europe for the Transvaal in its negotiations and war with Great Britain, and he was said to have received large sums from the Transvaal government to aid him in effecting his purposes.

LIBERIA, an independent negro republic of western Africa, lying on coast of North Guinea, between 5° N. and 8° N., and bounded on the southeast by the river Cavally and on the northwest by the river Manua. The distance between these rivers is from 300 to 350 miles, and as Liberian territory extends some 250 miles inland the area of the country, though variously given by different authorities, is probably about 75,000 square miles. The population has been placed at 1,068,000, but according to more recent statements, it is about 1,500,000. Of these, some 24,000 are

civilized Americo-Liberians, while the rest of the inhabitants are aboriginal blacks, most of them still being in a barbarous condition. The capital is Monrovia; population about 6000; the populations of the other leading towns are estimated as follows: Buchanan, 5000; Edina, 5000; Harper, 3000; Robertsport, 1200.

According to the constitution, which is modelled on that of the United States, the chief executive authority rests with a president, elected for two years, and assisted by a cabinet representing the departments of state, finance, interior, justice, war and marine, and ports. The president in 1899 was Mr. William David Coleman, who, as vice-president, succeeded to the office upon the death of President J. Cheeseman, November 13, 1896. The legislative power devolves upon a congress of two houses, the senate and the house of representatives, there being eight members in the former, elected for four years, and thirteen members in the latter, elected for two years. There is no army, but the government possesses two small revenue gunboats.

The revenue is derived chiefly from customs duties; the cost of general administration is the principal expenditure. Revenue and expenditure in 1894 were reported to be \$156,179 and \$154,062, respectively; for 1898 the reported revenue and expenditure balanced at \$194,640 (£40,000). A debt of \$486,600 (£100,000) at 7 per cent. was contracted in England in 1871; the interest on this, unpaid since August, 1874, amounted in 1899 to \$868,581 (£178,500), making the total foreign debt \$868,581. There is also an internal debt, of which the interest arrears exceed the principal. Accounts in Liberia are usually kept in United States currency.

The principal exports are coffee, palm kernels, palm oil, cacao, rubber, sugar, ivory, arrowroot, hides, and piassava. Among the leading imports are cottons, haberdashery, provisions, hardware, earthenware, and rum. Statistics of the foreign commerce of Liberia are greatly at variance. One authority states that the combined annual exports and imports "probably do not exceed £500,000" (\$2,433,000); another, that the exports in 1897 amounted to £212,500 (\$1,034,025), and the imports, £250,000 (\$1,216,500); while the summary of commerce and finance for August, 1899, issued by the United States Bureau of Statistics, Treasury Department, placed the exports for the fiscal year 1896-97 at \$689,031, and the imports, \$505,235. This last authority also states that Germany sends nearly two-thirds of the imports, with Great Britain second in rank, and that the trade with the United States is less than that with France or Holland.

Some speculation was called forth in the latter part of 1899 by the visit to Liberia of the United States cruiser *Montgomery*. In some quarters it was thought that the United States was intending to negotiate for a coaling station on the Liberian coast. Another interpretation was that the United States was about to join Great Britain in requesting France to fix the boundary of her territory touching Liberia. It seems that for a number of years France has been encroaching on the territory of the little republic.

LIBRARY ASSOCIATION, AMERICAN, a national body organized in 1876 and incorporated in 1879. Its purposes are the promotion of library interests, the interchange of experience and opinion, the obtaining of larger results from library labor and expense, and the advancement of the profession of librarianship. It also seeks to strengthen the public library as a factor of the American educational system, and to that end acts in co-operation with the library department of the National Educational Association. The American library exhibit, to be made at the Paris Exposition of 1900, has been specially prepared by the New York State Library for, and is largely the outcome of work done by, members and committees of the Association. Its membership numbers 600. The annual meeting of 1899 was held at Atlanta, Ga. The next and twenty-second general meeting will be held in Montreal, Canada, in June, 1900. The president and secretary respectively for 1899-1900 are Reuben G. Thwaites, secretary and superintendent of the State Historical Society, Madison, Wis., and Henry J. Carr, librarian of the Scranton (Penn.) public library.

LIFE SAVING SERVICE. The number of shipwrecked persons succored at United States life-saving stations during the year ending June 30, 1899, was 751, bringing the total for 28 years up to 14,627. Only one station, located on the Atlantic coast, was added during the year, making 265 stations in all. Most of the stations are on the Atlantic coast, there being 193 there, against 15 on the Pacific, 56 on the lakes, and one at the Falls of the Ohio, at Louisville, Ky. Further figures for the last fiscal year of the service are as follows: Disasters, 428; persons involved, 3903, of whom 56 were lost; property involved, \$8,104,640, of which \$1,842,740 was lost. In addition, 294 small craft were involved, containing 671 persons, of whom 7 were lost. The total cost of maintaining the service for the year was \$1,509,831. The Volunteer Life Saving Corps of the State of New York, inland waters, has 672 stations and saved 433 lives last year. Its head office is at 63 Park Row, New York City. The United States service is attached to the Treasury Department, Washington, D. C.

LI HUNG CHANG, Chinese statesman, was born February 16, 1823, in the province of Ngau-hwuy. He became provincial judge of Chêkiang, and in 1860, while governor of Thiang-sin province took part with Colonel (later General) Gordon in suppressing the Taeping rebellion. He received many honors, and was elevated to various official positions. Of some of these during his career he has been divested, but they have subsequently been restored to him. At the outbreak of the war with Japan in 1895 he had charge of the naval, military, and financial affairs of the empire, but early in the war was deprived of some of his honors and removed from the chief command, although he remained prime minister. In March, 1896, he left China to represent the Emperor at the Czar's coronation, and then made his memorable journey around the world. He reached Peking in October, and was soon made minister of foreign affairs, but soon after, for an alleged breach of court etiquette, was fined a year's salary. He declared his intention to retire to private life, but was retained, probably in the interest of the Empress Dowager and her party. In June, 1898, the Emperor conferred on him the Order of the Double Dragon (third degree, first class), an honor never before accorded to a Chinese subject. In September, 1898, he was dismissed from the Tsung-li-Yamen, on account of the Lu-han railway contract, but was shortly afterward reinstated by the Empress Dowager, who appointed him imperial commissioner to report on the Yellow River. His report occasioned an imperial decree, issued April 24, 1899, directing the provision of 400,000 taels for material required for works on the Yellow River; 600,000 taels for dykes, and 2,000,000 taels for deepening the mouth of the river. Li Hung Chang is friendly to foreigners, and especially favors Russians. He is a man of large intellect, a shrewd diplomat, and has attained a power never equalled by a Chinese subject.

LINDSEY, Eleventh Earl of, MONTAGU PEREGRINE BERTIE, a captain in the Grenadier Guards, retired, died January 29, 1899. He was born December 25, 1815, and succeeded his brother to the title in 1877. His heir is his son, Lord Bertie, who was born in 1861.

LIPTON, Sir THOMAS JOHNSTONE, an English provision merchant, was prominent in 1899 through the part he had in the international yacht race, which took place off Sandy Hook in October. He owns the *Shamrock*, which was defeated by the American cup-defender *Columbia*. (See YACHTING.) Lipton was born in Glasgow, Scotland, of Irish parentage. He is president of the Thomas J. Lipton Company, pork packers, Chicago, is proprietor of the Lipton Refrigerator Car Lines in the same city, and owns tea estates in Ceylon. He was knighted in 1898. His sportsmanlike bearing before and during the races of 1899 made him very popular in America. His home is at Southgate, Middlesex, England.

LIQUID AIR IN MEDICINE. Tardy reports of the use of liquid air in medicine come to our notice. As a local anæsthetic it has been very successful, the only danger being that the part anæsthetized may become actually frozen. It has been found useful in the local treatment of ulcers of the leg, for example, abscesses, boils, carbuncles, and buboes. It relieves as by magic the pain of sciatica, herpes zoster, and intercostal neuralgia. It has apparently no effect upon the virulence of anthrax, diphtheria, or typhoid bacilli, for each of these varieties of bacteria resisted its action, although exposed to it for ninety minutes. Vaccine virus also resisted it successfully. As a therapeutic agent liquid air is applied as a spray or by means of a swab. Some experimenters hope for good results in the treatment of cancer with liquid air; but no trustworthy results have yet been reached in regard to this disease.

LISBOURNE, Sixth Earl of, ERNEST GEORGE HENRY ARTHUR VAUGHAN, died September 4, 1899. He was born July 30, 1862, and succeeded to the title on the death of his father, the fifth earl, in 1888. His heir is his son, Lord Vaughan, who was born in 1892.

LITERATURE, AMERICAN AND ENGLISH. I. AMERICAN.—The production of books in this country during 1899 has never been equalled by that of any other year in the world's history, and the limited space at our disposal precludes the possibility of giving even the titles of all that really merit inclusion. While the masterpieces, those that will stand the test of time, might perchance be counted on the fingers of one hand, the name of those well fitted to give pleasure or instruction is literally legion. We begin with that class of literature which appeals to by far the largest class of readers. It is to be noted that a number of the most widely read novels of this year were published last year. As far as possible this article will confine itself to the publications of the current year, although allusions to former publications are inevitable.

Fiction.—In this department the year is remarkable as having witnessed the publi-

cation of several novels that have broken all previous records in the way of extraordinary sales. Those which attained such extraordinary popularity were: *David Harum*, by Edward Noyes Westcott, and *When Knighthood was in Flower*, by Charles Major (both published in 1898); *Richard Carvel*, by Winston Churchill, a historical romance of the eighteenth century, admirable and even distinguished in its style; and *Janice Meredith*, by Paul Leicester Ford, a vigorous historical novel dealing with the time of the American Revolution. The very great popularity of these books shows a healthy tone in the public mind. *The Greater Inclination*, by Mrs. Edith Wharton, a collection of short stories exhibiting in the highest degree that rare creative power called literary genius, met with much appreciation from the critical portion of the public, and was declared by one eminent critic to be "the one work of fiction belonging to the present year which is equal to the very best in its own class." *McTeague*, by Frank Norris, was the only important representation of the realistic novel that the year produced. The story is a strange and impressive one, and depicts with power and vigor the sordidness and brutality of life. *The Market Place*, Harold Frederic's posthumous novel, though not of sustained excellence throughout, is a vivid study of the modern financial world, and took high rank among the fiction of the year. *No. 5 John Street*, by Richard Whiteing, an artist in irony, was the best socialistic novel of the season, as well as one of the best selling ones; it is a strong and stirring story, and proves that its author is not only a skilful writer but a man of wide reading in many literatures. *The Open Question*, by C. E. Raimond, is a problem novel which attained a large measure of favor. The problem is the morality of suicide in a case where the curse of inherited disease, in every representative of a given race, vitiates the mental or the bodily energies, or both. The story has little incident, its events being those of the immaterial world, crises in the development of character, climaxes of emotional experience. Notwithstanding its occasional defectiveness it was considered a very clever novel, revealing a thoughtful, cultivated, and imaginative mind. *The Maternity of Harriott Wicken*, by Mrs. Henry Dudeney, is a study in degeneracy, of remarkable power, written with a strong grip on her subject, and with a gleam here and there of real humor. *The Two Standards*, by Dr. William Barry, one of our ablest critics of literature and social life, is the popular exposition of some of its author's beliefs, depicting the sordid influence of an undue accumulation of wealth, and reaching the conclusion that the love of money pervades the life of to-day. Whether or not he proves his case, there is in his book the presence of a mighty purpose. The position which he holds is one in which much study and searching have confirmed him. *A Tent of Grace*, by Mrs. Adelina C. Lust, is a story of unusual power and interest, manifested not only in the handling of its tremendous problem—the deep gulf between Jew and Christian—but in its literary style, which has a certain distinction of its own. *Children of the Mist*, by Eden Phillpotts, is a wholesome tale, true to life and place, full of deep interest, rare humor, and vivid descriptions. *The Stolen Story*, by Jesse Lynch Williams, includes seven first-rate newspaper stories, one of which, *The Old Reporter*, is a serious study of some psychological details of journalistic work. *The Awkward Age*, by Henry James, discreetly skirts the edges of forbidden subjects, and represents the apotheosis of the author's peculiar style. *Siren City*, by Benjamin Swift, has for its motive the conflict between puritanism and paganism, and many of its incidents take place in Naples, the "Siren City." *The Black Douglas*, by S. R. Crockett, is a romance of the fifteenth century in Scotland, and deals with the fall of the house of Douglas. *Swallow*, by H. Rider Haggard, was regarded as a veritable work of art, immensely superior to anything else that he had ever done. *A Confident To-Morrow* is a story of New York life by Professor Brander Matthews, in which the fortunes of a young writer form the subject of the narrative. It was received as "a thoroughly good and well-wrought piece of fiction, full of meaning and instinct with a profound appreciation of many things which it is well for all of us to know." *The Chronicles of Aunt Minervy Ann*, by Joel Chandler Harris, is a narration of the experiences of a counterpart to "Uncle Remus," a type of the negro "mammy" before the war. *Ragged Lady*, by W. D. Howells, was published early in the year, and *Their Silver Wedding Journey*, by the same author, in the fall. The first was the most important contribution to fiction of the month in which it was published, and the second is a restful story of travel in Germany, with no hurry about it and not much excitement, but a great deal of entertainment and enough human interests to flavor every change of scene and take the curse of instructiveness off every description. *The Custom of the Country*, by Mrs. Hugh Fraser, is much more than "Tales of New Japan"; it is a collection of idyllic love stories told with the warmth and passion of poetic feeling. The other works of fiction which have appealed to the greatest number of readers during the year (some of which, it will be observed, were first published last year, while others go back to a still earlier date of publications) have been:

- Red Rock. By Thomas Nelson Page.
 The Battle of the Strong. By Gilbert Parker.
 Mr. Dooley: In Peace and in War. By F. P. Dunne.
 The Little Minister. By J. M. Barrie.
 The Christian. By Hall Caine.
 Aylwin. By Theodore Watts-Dunton.
 Second Thoughts of an Idle Fellow. By Jerome K. Jerome.
 The Day's Work. By Rudyard Kipling.
 The Adventures of François. By S. Weir Mitchell.
 The Hon. Peter Stirling. By Paul L. Ford.
 Penelope's Progress. By Kate Douglas Wiggin.
 Hugh Wynne. By S. Weir Mitchell.
 The Prisoner of Zenda. By Anthony Hope.
 Prisoners of Hope. By Mary Johnston.
 The Gadfly. By E. Voynich.
 Rupert of Hentzau. By Anthony Hope.
 The Widow O'Callaghan's Boys. By Guielma Zollinger.
 A West Point Wooing. By Clara Louise Burnham.
 A Hungarian Nabob. By Maurus Jokai.
 Dross. By H. S. Merriman.
 A Triple Entanglement. By Mrs. Burton Harrison.
 The Ladder of Fortune. By Frances C. Baylor.
 Strong Hearts. By G. W. Cable.
 I, Thou, and the Other One. By Amelia E. Barr.
 Manders. By Elwyn Barron.
 That Fortune. By Charles Dudley Warner.
 The Dreamers—A Club. By John Kendrick Bangs.
 The Strong Arm. By Robert Barr.
 Doc' Horne. By George Ade.
 Concerning Isabel Carnaby. By Ellen T. Fowler.
 The Ship of Stars. By A. T. Quiller-Couch.
 When the Sleeper Wakes. By H. G. Wells.
 The Span o' Life. By William McLennan and J. N. McIlwraith.
- The Garden of Swords. By Max Pemberton.
 The Jamesons. By Mary E. Wilkins.
 The Short Line War. By Merwin Webster.
 Tiverton Tales. By Alice Brown.
 Young Lives. By Richard Le Gallienne.
 A Double Thread. By E. T. Fowler.
 The Fowler. By Beatrice Harraden.
 Agatha Webb. By Anna Katherine Green.
 The Lion and the Unicorn. By Richard Harding Davis.
 Stalky & Co. By Rudyard Kipling.
 The Orange Girl. By Walter Besant.
 Ione March. By S. R. Crockett.
 The King's Mirror. By Anthony Hope.
 Via Crucis. By F. Marion Crawford.
 Young April. By Egerton Castle.
 The Other Fellow. By F. Hopkinson Smith.
 Santa Claus's Partner. By Thomas Nelson Page.
 The House of the Wizard. By M. Imlay Taylor.
 Kit Kennedy. By S. R. Crockett.
 Little Novels of Italy. By Maurice Hewlett.
 The Vizier of the Two-Horned Alexander. By Frank R. Stockton.
 Mr. Dooley in the Hearts of his Countrymen. By F. P. Dunne.
 The Enchanted Typewriter. By John Kendrick Bangs.
 A Duet, with an Occasional Chorus. By A. Conan Doyle.
 The Gentleman from Indiana. By Booth Tarkington.
 In Connection with the De Willoughby Claim. By Frances Hodgson Burnett.
 Trinity Bells. By Amelia E. Barr.
 The Unknown Patriot. By Frank S. Child.
 The Queen's Twins, and Other Stories. By Sarah Orne Jewett.
 Those Dale Girls. By Frances Weston Carruth.
 Snow on the Headlight. By Cy Warman.
 Through the Surf Smoke. By Seumas MacManus.

Biography.—The biography of the year was especially rich in notable and valuable books. *The Life of William Morris*, by J. W. Mackail, presents a truthful and sympathetic record of a remarkable life, the life of a man exceptional in the versatility of his powers. *Reminiscences*, by Justin McCarthy, will be of great and permanent interest to all students of the nineteenth century, and especially attractive to bookmen of every class. The book, though not in name an autobiography, is in reality a self-revelation, and attracted deserved attention. *The Autobiography and Letters of Mrs. M. O. W. Oliphant*, arranged and edited by Mrs. Harry Coghill, was begun by Mrs. Oliphant as a record for her children, but when the last one died she could write no more. With her permission her relative, Mrs. Coghill, told the world all that it has a right to know of a singularly noble and heroic life, and the result is a human document of great value. *George Müller of Bristol*, by Rev. A. T. Pierson, appeals particularly to the readers of religious literature. In *The Life and Letters of Lewis Carroll* (Rev. C. L. Dodgson) Mr. Stuart Dodgson Collingwood shows that he rightly divined the secret of the beautiful side of Lewis Carroll's character and the charm which his personality and his work had for children in his strong and tender love for them. He saw in their unspoiled minds the best material for him to work on, and they appealed keenly to his æsthetic faculties, but

more than all else the reality of childhood appealed strongly to the simplicity and genuineness of his own nature. *James Russell Lowell and His Friends*, by Edward Everett Hale, D.D., is not a formal biography, but an admirable companion or supplement to the biographies of the persons included in the title, for it tells what would not properly come within the scope of those works. It covers, however, the editorial, political, literary, and diplomatic career of Lowell, and the incidental topics treated are numerous and enjoyable. *The Life, Writings, and Correspondence of George Borrow*, by William I. Knapp, Ph.D., LL.D., represents an astonishing amount of work, which has been so well and thoroughly done as to deserve the gratitude of all professed admirers of Borrow, who see in the subject of this book a pure, honorable, diligent, and high-minded man, entitled to rank among the foremost of the century as a master of English. *The Martyrdom of an Empress*, being the story of the murdered Empress of Austria, told by a woman (unnamed) who claimed to have been her intimate friend and confidante, is a very readable book, full of the tragedy that in one form or other marked the "hapless Hapsburgs." *Danton: A Study*, by Hilaire Belloc, does abundant though tardy justice to the character and achievements of this great figure in the second period of the French Revolution, and also gives a complete narrative of the most dramatic phases of the Revolution and a brilliant picture of France herself. *The Life and Public Services of Edwin M. Stanton*, by Hon. George C. Gorham, for some years secretary of the United States Senate, deals chiefly with the lawyer and the official, and disregards for the most part the characteristics of the man, much to be regretted on account of Mr. Stanton's striking personality, but is fully in keeping with Mr. Gorham's professed aim in writing the volumes, which was to mark the place in history to which Mr. Stanton's services to his country entitle him. *The Life and Letters of Sir John Everett Millais*, edited by his son, John Guille Millais, gives the history of most of the artist's pictures and brings the reader into most pleasant personal contact with the man and his friends. *The Letters of Robert Louis Stevenson*, edited by Sidney Colvin, were long expected and much talked of, and their final appearance was well calculated to fill with joy the heart of the lover of Stevenson. The number of the letters is high and the range is wide, for they were written from many parts of the world to correspondents of varied classes, old and young, grave and gay. *The Life of Danton*, by A. H. Beesly, is largely made up of Danton's speeches as recorded in the *Moniteur*. It is written from the standpoint of admiration in a style that is clear and judicial and masterful of detail. *Reminiscences*, by Julia Ward Howe, is essentially an informal review of a life which has come in touch with the spirit of its time at many vital points, and leaves a final impression of variety, fulness, and achievement. It throws light not only on such causes as those of antislavery, the war for the Union, and the change in the position of woman, but also upon many striking tendencies in thought, religion, and social affairs. *The Reminiscences of a Very Old Man*, by John Sartain, who was born in London in 1808, and died at the age of eighty-nine, is remarkable for the unfading freshness and pictorial precision of the author's recollections and his gift of simple, manly, sympathetic writing. When a mere boy he was apprenticed to an engraver, and for sixty-seven years his name was associated with the history of art in America, creating a name for some of our artists and carrying the names of others where they had never gone before and where they still remain in national estimation.

Other notable additions to this department of literature during the year have been :

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| The Life of Henry Drummond. By the Rev. George Adam Smith. | Nelson and His Times. By Rear-Admiral Lord Charles Beresford, C.B., M.P., and H. W. Wilson. |
| A Life of William Shakespeare. By Sidney Lee. | Thaddeus Stevens. By Samuel McCall. |
| Life of General Nathan Bedford Forrest. By John Allan Wyeth. | The Life of William Makepeace Thackeray. By Lewis Melville. |
| The Life of William Ewart Gladstone. Edited by Sir Wemyss Reid. | The Life of Charles Stewart Parnell, 1864-1861. By R. Barry O'Brien. |
| Ulysses S. Grant. By Hamlin Garland. | Bismarck, the Man and the Statesman, being the Reflections and Reminiscences of Otto, Prince von Bismarck. Written and Dictated by Himself after his Retirement from Office. |
| Horace Bushnell. By T. T. Munger. | The Life of R. W. Dale of Birmingham. By his son, A. W. W. Dale. |
| Memoirs of the Life and Correspondence of Henry Reeve. By John Knox Laughton, M.A. | Life and Letters of Phillips Brooks. By Professor A. V. G. Allen. |
| The Many-Sided Franklin. By Paul Leicester Ford. | Robert Raikes: The Man and His Work. With introduction by Dean Farrar. |
| The Life of Abraham Lincoln. By Ida M. Tarbell. | The Romance of Ludwig II. of Bavaria. By Francis Gerard. |
| Kate Field: A Record. By Lilian Whiting. | |
| Life of Pope Leo XIII. By F. Marion Crawford. | |

John Hancock: His Book. By Abram Newman Hall. An autobiography.
English Brown. Letters and Recollections of John Mur-
Mr. Froude and Carlyle. By David ray Forbes. Edited by his daughter,
Wilson. Sarah Forbes Hughes.

History, Travel, and Adventure.—*The American Revolution* (Part I. 1766-76), by the Right Hon. Sir George Otto Trevelyan, Bart., the biographer and nephew of Lord Macaulay, and a public man well versed in affairs, is specially important as coming from an Englishman, who treats both sides of the great struggle with perfect fairness. In addition to this, it is accurate, it is written with sympathetic intelligence, it represents broad culture as well as special knowledge, and it is interesting. *The Establishment of Spanish Rule in America*, by Bernard Moses, is a book of more than momentary value, although the power of Spain has passed from this hemisphere. Especially interesting and instructive is the contrast Dr. Moses draws between the methods of English and of Spanish colonization. *The Historical Development of Modern Europe*, Vol. II., by Charles M. Andrews, covers the period from 1850 to 1897, is marked by sound judgment combined with a complete mastery of facts and by lucidity of expression, and was regarded as, if anything, more praiseworthy than the preceding volume. *Holland and the Hollanders*, by David S. Mel-drum, received high praise. In it are combined the incidents of travel and the results of observation with historic facts, explanation of governmental and educational systems, and agricultural and commercial statistics in a way to make pleasant reading and give one a complete idea of the sturdy little kingdom. *Present-Day Egypt*, by Frederic Courtland Penfield, United States consul-general in Egypt in 1893-97, is a series of faithful pictures of Egypt as it is to-day. The collection is arranged with skill in a pleasing narrative and includes history, commerce, engineering, antiquities, agriculture, royalty, and social customs. *The English Radicals: An Historical Sketch*, by C. B. Roylance Kent, is a book that involved an immense amount of research and covers a wide field with most satisfactory completeness. It is said that hitherto the Radical party has had no historian, and that Mr. Kent's work has been so well done as to make his book an acceptable encyclopædia of advanced political thought in England. *The United Kingdom: A Political History*, by Goldwin Smith, D.C.L., is especially valuable as a complete and self-contained history of the political development of England, based on recent research. It describes how England, in the last fourteen centuries, has solved the problem of constitutional government and how she has become an imperial power, beginning with the migration of the Angles, Jutes, and Saxons to England in the fifth century, and coming down to points so comparatively recent in the history of England as the accession of Peel to power in 1841, and the confederation of Canada in 1867.

Early in the year there was a decided falling off in the demand for war literature, even the recent publications by well-known authorities, and a similar lack of interest was noticeable in the case of the dramatised works which during the preceding months was so prominent. But as the months went by there was a noticeable increase in the call for Spanish text books and dictionaries, both for the study of Spanish in America and in our new possessions, and in the latter for the study of English. We note a few of the most popular of the books called forth by the war with Spain. *The Maine*, by Captain Charles D. Sigsbee, is a dignified, sober account of the destruction of the *Maine* in Havana harbor, February 15, 1898, and a clear, terse exposition of his reasons for believing that the explosion was due to external causes. *With Sampson Through the War*, by W. A. M. Goode, the correspondent of the Associated Press on board the flagship *New York*, describes the operations of the North Atlantic squadron in Cuban waters up to and through the memorable 3d of July, and is supplemented with chapters by Admiral Sampson, Captain Robley D. Evans, and Commander C. C. Todd. *The Sinking of the Merrimac*, by Lieutenant Hobson, had a peculiar interest at the time of its publication. *The Cuban and Porto Rican Campaigns*, by Richard Harding Davis, took rank as one of the most entertaining and at the same time most instructive contributions to the literature of the war. *Our Navy in the War with Spain*, by John R. Spears, was a decided acquisition to the history of the United States Navy. *In Cuba with Shafter*, by Lieutenant-Colonel John D. Miley, is a plain, straightforward story, founded on abundant knowledge of facts, since the writer was General Shafter's principal aide-de-camp. *In The Fight for Santiago* Mr. Stephen Bonsal aims to tell the story of the private soldier and his misfortunes. *Campaigning in Cuba*, by George Kennan, is not the work of an eye-witness or a participant; the writer saw the campaign from a Red Cross steamer and looked at everything from the hospital standpoint. *Fighting in Cuban Waters*, by Edward Stratemyer, is especially designed for the delectation of youthful patriots. *History up to Date*, by William A. Johnston, furnishes a résumé of the whole war, from the causes that led up to it to the treaty of Paris. *The War with Spain*, by Henry Cabot Lodge, will probably become a permanent authority on the war. *The Story of the Rough Riders: The Regiment in Camp and in the Battlefield*, by Ed-

ward Marshall, is a complete record of the military manœuvres of the war in Cuba by a typical American newspaper man, who for his valor and devotion to duty received from Governor Roosevelt the medal of the Rough Riders. It is the personal element of the narrative that gives it its value, dealing as it does with incidents that the historian will not consider worth chronicling, but that will in the years to come form the romance of those short but arduous days. *The Rough Riders*, by Theodore Roosevelt, said near the end of the year to be the only one of the recent numerous publications on war subjects that was selling to any extent, is a straightforward, animated, picturesque narrative brimming over with human nature, humor, and all the lights and shades of the primitive passion of war. It has been characterized as such a "powerful commentary upon the Santiago campaign that it stands pre-eminent among its contemporaries in serious military value."

Quaint Corners of Ancient Empires: Southern India, Burma, and Manila, by Michael Meyers Shoemaker, was of special interest, owing to the conflict in the Philippines, with its descriptions of interesting edifices and oriental customs. Many works about the Philippines that were widely read throughout the year were published in 1898, and so need not be mentioned here. *Picturesque India*, by the Right Hon. Sir Richard Temple, written from actual experience, describes England's greatest possession and contains thirty-two illustrations by the author. *The Land of the Pigmies*, by Captain Guy Burrows, with an introduction by H. M. Stanley, describes instructively and entertainingly the characteristics and customs of some of the more important of the Central African tribes. *Under the African Sun*, by W. J. Ansorge, takes the reader from the east to Uganda, a region practically contiguous to that at which Captain Burrows arrives from the west—the two books forming together a good account of a trip across Central Africa from the Atlantic to the Indian Ocean. In *On the South African Frontier*, William H. Brown tells the story of what happened in Mashonaland and Matabeleland during the critical years of the colony, including his own personal adventures as hunter, miner, farmer, curio-collector, etc. In *A Prisoner of the Khaleefa*, Mr. Charles Neufeld narrates with great particularity and many incidents the story of his compulsory sojourn for nearly twelve years among the Mahdists, part of the time loaded with chains, till Omdurman was taken by the British forces. Of special interest are the descriptions of the death of General Gordon and the capture of Omdurman. *The Land of the Long Night*, by Paul Du Chaillu, although addressed chiefly to young people, contains scores of pages that will interest the veteran reader, inasmuch as the far North is to-day still a land of mystery, notwithstanding all the big books that have been written about it. The trip so well described began in October and lasted till spring, and took the writer from the southern coast of Sweden to Nordkyn, within sight of North Cape. *A Thousand Days in the Arctic*, by Frederick G. Jackson, records the life and work of nine scientific observers in one of the most desolate parts of the world for a longer period than any other explorers have voluntarily remained in the Arctic regions, and is valuable not only for its entertaining narrative but also for the valuable information which it contains. The situation in South Africa, especially toward the end of the year, naturally created a great demand for works dealing with that region. Prominent among those which met with considerable popularity were three, each written from an entirely different point of view: *Oom Paul's People*, by Howard C. Hillegas, is written with the old-fashioned American spirit of dislike for Great Britain and suspicion of all her doings, and extols the innocence and virtues of the Boers, *South Africa*, by W. J. Knox Little, is written from the opposite point of view, and, as one critic said, the two books do not agree on any one point except the dustiness of Johannesburg. *The South African Question*, by Olive Schreiner, is written from the Africander point of view, and while criticised as having rather too much of the sentimentality of all her later writings is admitted to be at times genuinely stirring and in great measure to ennoble a discussion that has not been noticeable for its dignity. *The Transvaal from Within*, by J. P. Fitzpatrick, was a timely work to meet the demand for information regarding South Africa. *White Man's Africa*, by Poulteney Bigelow, and *Europe in Africa in the Nineteenth Century*, by Mrs. Latimer, were also in demand.

Tramping with Tramps, by Josiah Flynt, had an unusual sale for a book that did not belong to fiction. It is a study of the life and characteristics of vagabonds and criminals by one who joined the great army of tramps, which he estimates at sixty thousand in the United States, frequented their haunts, and saw even prison life from the inside. The author is a young university man, who has tramped in both Europe and America. *A Texas Ranger*, by N. A. Jennings, narrates the life and surprising adventures of a young man on the Rio Grande frontier in a company of Texas rangers during the early eighties, and brings before the reader many historic figures of the plains. Mr. Frederick Palmer's *In the Klondyke* gave its readers a more graphic and satisfactory idea of life in that region than had previously appeared, and contained many facts of real significance. *Two Women in the Klondyke*, by Mary

E. Hitchcock, is the story of a journey undertaken in the summer of 1898 by Mrs. Roswell D. Hitchcock, the widow of the late Commander Hitchcock, U.S.N., and Miss Van Buren, a grandniece of President Van Buren. *Alaska and the Klondike*, by Angelo Heilprin, professor of geology at the Academy of Natural Sciences of Philadelphia, describes a journey to the new Eldorado, with observations on the physical history and geology of the gold regions. Mr. Hamlin Garland's *The Trail of the Gold Seekers* is the literary result of his trip over the trail in 1898, when he led a pack-train from Ashcroft, British Columbia, to the Stickeen River, and afterward joined the miners' stampede for the Atlin Lake country. But the work of which Mr. Garland is said to be most fond is contained in his latest book, *Boy Life on the Prairie*, which shows the life of the boy of the western plains in prose, as Mr. Riley has written it in verse.

Mr. Rudyard Kipling's severe and protracted illness in the midst of which occurred the death of his little daughter Josephine, while visiting in New York early in the year, "not only evoked from all classes of people in all parts of the civilized world spontaneous tributes to the distinguished writer's genius, but brought to English-speaking peoples the first full realization of the extent to which Kipling embodies that tremendous vitalizing power and moral force which is the lifespring and the best hope of literature." Whether or not the sympathy and love thus awakened was responsible for the fact, it has been a great Kipling year. His *Day's Work*, although rated far below much of his other work, has had an enormous sale. *Stalky and Co.* has been severely criticised. One of his books published this year, however, has received the highest praise. *From Sea to Sea* contains the collected letters of travel which Mr. Kipling had written at different times between 1890 and 1898, some hitherto unpublished matter, and an accurate text (for the first time) of the *American Notes*. In the opinion of some critics, these letters are so well written and describe in such fresh, crisp language the scenes and customs of India, China, and Japan that they rank among the author's best writing.

Miscellaneous.—The development of a general respect for intelligent criticism and an appreciation of its authority, in a literary epoch characterized as "noisy and multitudinously productive," is indicated by the increasing number of books either dealing with criticism abstractly or exemplifying its principles in the measurement of work by definite standards. In *Some Principles of Literary Criticism*, Professor C. T. Winchester attempts a general examination of a very wide field, which is sufficiently sound and sufficiently comprehensive to serve as a practical working basis for the student of literature. *The Authority of Criticism*, by William P. Trent, is admirable in spirit, broad and scholarly in view, and charming in style. *What Is Good English? and Other Essays*, by Harry Thurston Peck, is the expression of the writer's personal opinion on the various subjects treated, in such a vivid and straightforward manner as to afford intense satisfaction to those who agree with him, and to arouse violent opposition in the minds of those who look at life from a different point of view. *Fisherman's Luck*, by Henry van Dyke, D.D., is a series of essays that make pleasant reading. *University Problems*, by President Daniel C. Gilman, of Johns Hopkins University, is a collection of addresses giving both the ideal with which his work began, and the ripened convictions which its progress has produced, and forms, as a whole, a noteworthy utterance on the aims of the higher education. *Modern Political Institutions*, by Simeon E. Baldwin, LL.D., is a collection of essays and addresses dealing with living political institutions, and abounding in apt illustrations, thus affording both pleasure and instruction. *The Development of the English Novel*, by Wilbur L. Cross, undertakes a minute survey of the growth of prose fiction from the Arthurian romance to Stevenson, and easily takes precedence of any book covering the same ground. *American Lands and Letters*, by Donald G. Mitchell, covers the period "from Leather Stocking to Poe's 'Raven,'" a period which includes many of the greatest names in our literary history, and contains many rare portraits, fac-similes, and views of literary interest. *The Cathedral Builders: The Story of a Great Masonic Guild*, by Leader Scott, is a handsome and elaborate monograph in which is concentrated the light of extensive research on a problem of real importance in the history of architecture, and of deep interest to all students of the past. *The Solitary Summer*, by the author of *Elizabeth and Her German Garden*, is a charming little book abounding in descriptive passages that are full of poetry, quaint remarks that are suggestive and interesting, and a wise philosophy that is wholly commendable. *Imperial Democracy*, by David Starr Jordan, president of Leland Stanford Junior University, was a timely book, presenting the various phases of a democracy's entrance upon imperialism in the light of history as well as recent facts and developments. *Through Nature to God*, by John Fiske, took its place with his other books of a similar nature, which are always in good demand. *Ruskin, Rossetti and Pre-Raphaelitism* is an interesting collection of the Rossetti family papers, edited by W. M. Rossetti, and containing sixty letters and other papers by Mr. Ruskin, dating from 1854 to 1862. There are also twelve

plates from pictures by Dante Rossetti. *Matthew Arnold*, by Professor George Saintsbury, was a notable volume, treating of the work of the great English critic.

The publication of the *Letters of Robert Browning and Elizabeth Barrett Barrett*, 1845-46, was considered the most important literary event of February. These letters fill two large volumes, and are the most important addition to the history of human character and of poetry for many a year. Though among the most closely intellectual letters ever exchanged, their matter was one thing—love. His letters are almost entirely filled with the setting forth of the “thinking-out of love, which was the life-work of his intellect during the whole year and a half covered by the correspondence,” and the passionate praises of his friend, poet, and love; hers sound the most harmonious antiphon: the intelligence of love, the humility, the gratitude. *The Cruise of the Cachalot*, *Idylls of the Sea*, and *The Log of a Sea Waif*, by Frank T. Bullen, were real additions to the literature of the sea, characterized by breeziness of style and unequalled in their delineations of deep-sea wonder and mystery. *Trooper 3809*, by Lionel Declé, treating of life in the French army, scored a great success. *Letters from Japan*, by Mrs. Hugh Fraser, is a vivid picture of life in the capital which is the centre of Japan’s vitality to-day; and where Mrs. Fraser, as wife of the British minister to Japan, had exceptional opportunities to observe the people as well as exceptional sources of information. *The Dreyfus Case*, by Fred C. Conybeare, rendered a real service at the time of its publication by recounting clearly the widely discussed case from its inception to its status at the time of publication. The book was published before the final disposition of the case. Probably the most popular of the numerous publications relating to that famous case was the *Letters of Dreyfus*, written to his wife, although *The Tragedy of Dreyfus*, by G. W. Steevens, who was a reporter at the trial in Rennes, and *The Dreyfus Story*, by Richard W. Hale, a compact and orderly account of the whole proceeding, should not go unmentioned. *The Break-Up of China*, by Lord Charles Beresford, is full of reliable first-hand information concerning existing conditions in China, and shows how the Eastern question is regarded in the East. *The New Far East*, by Arthur Diösy, the founder of the London Japan Society, explains the game of diplomacy now being played in the Orient, although the author is mainly concerned with the prospects of Great Britain in China. *The Dutch and Quaker Colonies in America*, by John Fiske, was undoubtedly one of the leading books outside of fiction. *Truth and Error, or the Science of Intellection*, by Major J. W. Powell, is a curious and interesting work written by a man of wide range of thought and action. *Earth Sculpture, or the Origin of Land-Forms*, by James Geikie, LL.D., F.R.S., is the latest contribution to geology by one of the ablest of interpreters in all that relates to the later changes in the history of the earth’s surface; in this book he has brought together in a popular form the results of his own studies and those of other inquirers concerning the ways in which the land has been given its varied shape.

A Literary History of Ireland from Earliest Times to the Present Day, by Douglas Hyde, LL.D., is a comprehensive volume that was warmly welcomed by all who felt that the Gaelic element in art and literature had been too long minimised and overlooked, in which the author labors in a spirit both wise and plausible to set forth the merits of the early race, carrying through his literary work an interesting history of race origin, influence, and characteristics. *The History of Japanese Literature*, by William George Aston, covering the whole of the long period from the sixth century to the present day, was on the whole disappointing, being regarded rather as a book of reference than the brilliant and informing work which his long residence in Japan would lead his readers to expect. *A History of English Dramatic Literature*, by A. W. Ward, Litt.D., LL.D., in three volumes, is a new and much-needed edition of a work that became the standard authority on its subject when first published about a quarter of a century ago, since which time no work has been produced at all competing with his in scope and aim. *A History of English Romanticism*, by Henry A. Beers, is full of that love of letters which is the soul of criticism. *In Ghostly Japan*, by Lafcadio Hearn, was regarded by many as the most fascinating of Mr. Hearn’s works, taking one into the very heart of Japanese life. *The Map of Life*, by W. E. H. Lecky, lacks originality and unity of system, but shows the large learning and wisdom of the man who has for the past fifty years exercised considerable authority both in history and in ethics. *A Dividend to Labor*, by Nicholas Paine Gilman, is credited with containing practically everything that has been done in an effort to bridge over the chasm which separates in our time the employer from the employee, and shows that we are moving toward a more just and more humane industrial order.

The Book of Golf and Golfers, by Horace G. Hutchinson and Others, is a definitive volume on this subject; it is admirable in structure and entertainingly illustrated. *A Guide to the Wild Flowers*, by Alice Lounsberry, with numerous colored illustrations was an attractive addition to the already large list of books on this subject. Other books on outdoor subjects which were well received were: *The First*

Book of Birds, by Olive Thorne Miller; *Field Key to the Birds*, by Edward Knobel; *Field, Forest, and Wayside Flowers*, by Maud Goings; *How to Know the Ferns*, by Mrs. Dana, and *The Bee People*, by Margaret Morley.

The list of illustrated books was large and attractive, in the preparation of which photography occupies a prominent place. *The Education of Mr. Pipp* was Charles Dana Gibson's new volume of illustrations; an illustrated edition of *Janice Meredith*, in two volumes, contained 58 illustrations, 14 fac-similes and reproductions from old prints, and 2 miniatures in color. There were also, among others, new and attractive editions of *Hugh Wynne*, *The Marble Faun*, and *The Grandissimes*. *Sketches in Egypt*, by Charles Dana Gibson, wherein he is both author and artist, was intended more for amusement than instruction, and the intention is faithfully carried out. *Modern Daughters: Conversations with Various American Girls and One Man*, by Alexander Black, is profusely illustrated by pictures evidently taken from life, showing the American girl in every costume, from the heroine of Greek tragedy to the short-skirted bicyclist. *Bob: The Story of our Mocking-bird*, by Sidney Lanier, is an accurate contribution to amateur observation in natural history, the illustrations of which are particularly noteworthy.

The steadily increasing number of good books upon music published within the last few years is worthy of note. In this department of literature there has been a remarkable accession to the number of publications designed to explain to the uninitiated some of the more complex things that go to make up the structure of modern music as well as some of the higher æsthetic problems connected with it. This indicates a growing fondness for music in this country. *The Orchestra and Orchestral Music and How Music Developed*, by William J. Henderson, seemed particularly responsive to the public demand for enlightenment. The author is regarded as a clear and sound thinker on musical subjects, and an able expositor of the complications that enmesh many aspects of them. His *The Pianoforte and Its Music* is the initial volume in the *Music Lover's Library*. *Mezzotints in Modern Music*, by James Hunker, attracted the attention of the reading public as well as that of opera and concert devotees. *Masques and Mummings*, by Charles Frederic Nirdlinger, took rank as one of the most important books that have been published in years on the subject of the drama. The author occupies a unique position, being rated as probably the most hated and the most admired dramatic critic in America. Although the collection of essays is marred by blemishes and impertinences, it was conceded that "nothing so strong, so vivacious, so true to the 'eternal verities'" had appeared in this country for years. *A Study of Wagner*, by Ernest Newman, has been styled the first sympathetic exposition of the philosophy, the art theories, and the general intellectual position of the late Richard Wagner, and commends itself equally to the Wagnerian and to the anti-Wagnerian, so admirably in balance is its judgment. *Fragments of an Autobiography*, by Felix Moscheles, and *Recollections of an Old Musician*, by Thomas Ryan, also deserve mention. *A Guide to the Operas*, by Esther Singleton, met with great success. It is a comprehensive discussion of the principal operas, giving the story, stage setting, analysis of the music, etc.

Poetry.—The lack of new poetry worthy of note was especially marked, but there were many reprints and new editions of the standard poets, for which there was a great demand, noticeably Longfellow, Tennyson and Browning. James Whitcomb Riley, Eugene Field, and Paul L. Dunbar. The most notable volume of lyrics printed during the year was *The Man with the Hoe, and Other Poems*, by Edwin Markham, which shadows forth the labor and the care in which the world abounds and shows that at the heart of life there is promise and hope and power. The writer believes that unselfish labor furnishes the only basis for regenerating the world, while fraternity is to him the holiest of all words, being at once "the essence of all Gospels and the fulfilment of all Revelations." *The Wind Among the Reeds*, by W. B. Yeats, was called "a little book of distinctly accentuated genius," and has been described as a prose sequence of Celtic fairy tales and a poetic chain of comment thereon. *The Collected Poems of William Watson* was received as a distinguished contribution to the sum of genuine poetry. *Lyrics of the Hearth-Side*, by Paul Laurence Dunbar, fully maintained the reputation and warm interest which the author had won from a wide circle of readers. *Within the Hedge*, by Martha Gilbert Dickinson, discloses a keen apprehension of the various suggestions and analogies that nature may offer in the contemplative study of human life. *The Island Race*, by Henry Newbolt, celebrates in the most glowing terms and with unflinching rhythm and "swing" the deeds and daring of the English. *Hermione*, by Edward Rowland Sill, is a collection of lyrics characterized by clarity of thought and delicate craftsmanship. *Antigone*, by George Herbert Palmer, is a translation from the Greek in which not only the spirit but the letter of the original is wonderfully preserved, while the introductory note by Professor Palmer, with its sketch of the ancient story and its pertinent observations on the character and province of the Greek chorus, is of exceeding interest. *Sicilian Idyls*, by Jane Minot Sedgwick,

have in some instances a perfection of lyric grace that has caused the writer to be compared favorably with Mrs. Browning. *Bandanna Ballads*, by Howard Weeden, with Introduction by Joel Chandler Harris, include, with new material, the poems and pictures issued by the author as *Shadows on the Wall*, which was very successful. Miss Weeden is said by competent judges to depict the old-time negro "mammies," house servants, and farm-hands with wonderful reality and feeling. *Wild Eden*, by George Edward Woodberry, is a collection of lyrics having to some extent the spirit of true poetry, and *Sea-Drift*, by Grace Ellery Channing, was a noteworthy little volume.

Books for Children.—Juvenile publications were especially numerous, the work of many well-known writers and some new ones. *The Boys' Book of Inventions*, by Ray S. Baker, tells for the younger generation stories of some of the most noteworthy marvels of modern science, and proved very fascinating to the class for which it was written. *The Court of Boyville*, by William Allen White, showed that Mr. White was an adept in delineating the joys and woes of that strange genus, the Boy. *From Cattle Ranch to College: The True Tale of a Boy's Adventures in the Far West*, by Russell Doubleday, is a narrative enticing enough for the old, simple enough for the young, and refreshing throughout, while the spirit is good and wholesome. *The Half-Back*, by Ralph H. Barbour, could not fail to appeal to all boys who are fond of outdoor sports. *Peril and Prowess* is a collection of stories by well-known writers, resulting in a volume of great variety. *Little Jim Crow*, by Clara Morris, the well-known actress, is a collection of more or less pathetic stories. *Rupert's Ambition*, by Horatio Alger, Jr., is a thrilling tale of adventure. *The White Beaver*, by Harry Castlemon, is a story of woodcraft and forest life. *The Hero of Manila*, by Rossiter Johnson, puts the famous admiral intimately before young minds. *Iron Heart, War Chief of the Iroquois*, by Edward S. Ellis, is an exciting romance of pioneer life. *Dorsey, the Young Inventor*, by the same author, is an interesting story by means of which the author manages to convey considerable valuable information. *The Boys of Crooby*, by Ruth Hall, is a romance of early American life. *Henry in the War*, by General O. O. Howard, is a story from real life, "the war" being that of 1861-65. *Under Otis in the Philippines*, by Edward Stratemeyer, is a story of even more timely interest, the title of which explains itself. *The Voyage of the Avenger: in the Days of Dashing Drake*, by Henry St. John, is particularly interesting at this time which marks the downfall of Spanish naval power. *The Young Rajah*, by Arthur Lee Knight, was one of the most artistically attractive gift books of the season for young readers, the scene of which is laid in the island of Ceylon. The other juvenile books published during the year included stories by Byron A. Dunn, Kirk Munroe, Hezekiah Butterworth, Elizabeth Stuart Phelps, Sarah Orne Jewett, Carolyn Wells, Amanda Douglas, Albert B. Payne, and Lily F. Wesselhoeft.

Classes.	1898.		1899.	
	New Books.	New Editions.	New Books.	New Editions.
Fiction.....	794	181	749	188
Law.....	417	39	454	35
Juvenile.....	356	17	434	14
Education and Language.....	364	13	397	23
Theology and Religion.....	406	40	393	27
Literary, History and Miscellany.....	313	19	304	42
Poetry.....	298	15	302	31
Biography, Memoirs.....	172	23	288	22
History.....	244	26	246	22
Political and Social Science.....	243	14	226	12
Fine Arts and Illustrated Books.....	144	19	194	20
Description, Travel.....	134	33	190	26
Physical and Mathematical Science.....	143	31	176	26
Medical Science, Hygiene.....	143	45	120	23
Useful Arts.....	106	6	99	24
Mental and Moral Philosophy.....	45	6	63	10
Domestic and Rural.....	40	3	55	3
Sports and Amusements.....	32	10	43	5
Humor and Satire.....	18	2	26	1
Totals.....	4,332	554	4,749	572
		4,382		4,749
		4,866		5,321

II. ENGLISH. At the beginning of the year the leading book in England was *With Kitchener to Khartum*. It had an enormous success; fifty thousand copies were sold at six shillings, and the sixpenny edition was subscribed for in one day. Several other works of the same class were also in great demand. Among the six-shilling novels, for which the demand was very great, those taking the lead were *Aylwin*, *Concerning Isabel Carnaby*, and *Roden's Corner*. The children's books that distanced all others in popularity were *Forgotten Children's Books* and Blackie's stories.

Thomas Hardy's *Wessex Poems* was regarded as a serious and important attempt in verse. The agitation against ritualism and Roman practices awakened an interest in ecclesiastical and Reformation literature; *The Secret History of the Oxford Movement* and Father Chiniquy's *Fifty Years in the Church of Rome* were widely read. There was a wonderful demand for the works of Rev. C. M. Sheldon, whose *In His Steps* was said to be the most widely selling book of the year in England; two million copies were sold in three months. In it the author attempts to fix the precise effect of a struggle after ideals of Christian perfection in the commercial life of to-day, and while the result is not to be classed as literature, its immense circulation shows how it appeals to the masses. Mr. Sheldon, who is an American, neglected to have his book copyrighted in England, and consequently thirteen different publishers issued it in editions ranging in price from half a crown to one penny. The publication of the Browning letters was an important item, and they were widely read. The interest felt in the Dreyfus case resulted in a great demand for F. C. Conybeare's book on the subject. Ian Maclaren's *Afterwards* had an excellent sale, as well as S. R. Crockett's *Red Axe*, showing that the Scottish school still flourishes.

Mr. Swinburne's new tragedy, *Rosamund, Queen of the Lombards*, was considered one of the most important books of the year. It is said to be written in a very old, but for him a very new, manner, and without any of his mannerisms, being severe, even to baldness, while the blank verse never sings; but it is a proof of the vitality of a poet who had won his distinction years before. A volume of poetry by Mr. John Davidson and a series of collected poems by Mr. William Watson were favorably received. The statement is made that Mr. Kipling is the only English poet who has a very large public. Among religious books, three were especially remarkable, the demand for them being so great that the publishers could hardly keep pace with it: Drummond's *New Evangelism*; Stalker's *Christology of Jesus*, and Matheson's *Life of Christ*.

There was a great call for books of travel, so that even very expensive works, like Nansen's in its earlier editions, found a ready market. The deep interest shown in the fate of China caused a large demand for Lord Charles Beresford's *Break-Up of China*. Works dealing with the Transvaal were naturally in great demand, and a little work by Olive Schreiner, dealing with south African affairs, attracted a considerable amount of attention. There was a noticeable diminution in the number of books for children published during the year, in marked contrast to the past few years, during which they have been very much overdone. Technical education manuals received increased attention, and they now cover many subjects upon which for many years only American treatises were obtainable. The popularity of Dr. Meiklejohn's series was notable, especially his *Geography*, *English History*, and *English Language*, which have outstripped all competitors. The growing interest in geography was so great as to lead to the publication by the Messrs. Newnes of an *International Geography*, containing some 500 maps, upon which at least seventy authors collaborated, forming a very interesting review of the world as we know it at the end of the century. There were a great many reprints of classics, the reason for which is difficult to understand, since it is perfectly well known that many of them do not pay their way.

Among biographical books the one that excited the greatest interest was the *Letters of Robert Louis Stevenson*. They were thought to give a true side of Stevenson, even if as a portrait they are incomplete, but the unanimous verdict was that they had been too severely and discreetly edited. An important biographical work was the *Life of Sir John Millais*, by J. G. Millais, the baronet's youngest son. It also contains chapters by Sir William Harcourt and Mr. Val Prinsel, and is elaborately illustrated. Mr. Clement Scott's *Autobiography* practically covers the period of theatrical history from the point where the standard Genest left off. Mr. Scott divides with Sir Henry Irving the honor of having practically given the stage its present prominence in English life. *The Life of Dr. Dale of Birmingham*, by his son, is full of valuable material and was well taken up. The *Autobiography* of Mrs. Oliphant was regarded as a notable book. *The Life of Sir Arthur Sullivan*, by Arthur Lawrence, and Mr. Charles Neufeld's account of his imprisonment under the Khalifa were two biographies of very different interest. *The Story of the People of England in the Nineteenth Century*, by Justin McCarthy, is a compendious narrative of the more

important events in the national progress, written for the class of people who have neither the time nor the preparation requisite for more minute researches.

It was noted as an unheard-of occurrence that not only was there no sensible diminution of new publications in what had formerly been known as the "dead season," but the output equalled that of any month during the past year, fiction being very much to the front. *Stalky & Co.*, by Rudyard Kipling, was received with universal disappointment as being totally unworthy of its author's genius. A very notable novel was *No. 5 John Street*, by Richard Whiteing, but the two novels which divided the honors of the spring season were *A Double Thread*, by Ellen Thornycroft Fowler, and *The Fowler*, by Beatrice Harraden. *The Fowler* is the story of an attempt at a mental seduction; in the end, however, the bird escapes the fowler and is received into better hands. It is by far the author's most ambitious effort. *A Double Thread*, which has been styled "a perfectly impossible and immensely entertaining book," is a story of London and country life. The plot has nothing original about it, but the style sparkles with all manner of clever and epigrammatic paradoxes. In the summer it was stated that the demand for cheap fiction increased with the ability of the publishers to turn out well-printed editions at a low figure; consequently there was a tremendous output of sixpenny editions of well-known novels, prominent among which was Mr. George Moore's *Esther Waters*. It also led to the starting of a new venture, called *The Novelist*, by the Messrs. Methuen, which opened with *Dead Men Tell No Tales*, by E. W. Hornung, a brother-in-law of Dr. A. Conan Doyle. This marked dominance of fiction Mr. Edmond Gosse regards as perhaps the most real danger which threatens the world of books to-day. *The Orange Girl*, by Sir Walter Besant, was accorded a warm welcome, and sold better than any other of his publications during the last few years. The second volume of the *Adventures of Captain Kettle*, by Cutcliffe Hyne, was as full of interest and impossibility as the first, and appealed to an equally large circle of admirers. *Unholy Matrimony*, by "John Le Breton" (Mr. Murray Ford and Miss Harte Potts), is a novel that was refused by several publishers in turn, yet when finally accepted and published it made a decided hit. *Prisoners of Hope*, Miss Mary Johnston's successful first novel, published in this country in 1898, was issued in England in 1899 under the title *The Old Dominion*, and made an impression on English critics "by the unusual power and dignity manifested and by the excellence of style." *The Human Interest*, by Violet Hunt, has an unusually pessimistic tone, but is a thoroughly good book, and is regarded as, on the whole, the best thing that Miss Hunt has yet done. *Red Pottage*, by Mary Cholmondeley, was the most popular of the new novels of the year. It contains situations that are undeniably new, and a great success is predicted for it.

The London Academy, instead of selecting the best three books published in 1899 to "crown," as heretofore, this year divided the 150 guineas at its disposal into 6 prizes of 25 guineas each, and awarded them as follows: In poetry, *The Wind Among the Reeds*, by W. B. Yeats; in fiction, *On Trial*, by "Zack" (Miss Gwendoline Keats); in biography, *Danton: A Study*, by M. Hilaire Belloc; in history, *England in the Age of Wycliffe*, by G. M. Trevelyan; in translation, the novels of Turgenyev, by Mrs. Garnett, and *The Social Life of Scotland in the Eighteenth Century*, by H. G. Graham, in miscellaneous works.

The following list includes the books that have been the most widely read throughout England during the year. A careful examination of it will not only show clearly the trend of the popular taste so far as the English reading public is concerned, but will demonstrate the difficulty of making a distinction between English and American literature.

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| With Kitchener to Khartum. By G. W. Stevens. | Mistress Nancy Molesworth. By J. Hocking. |
| Aylwin. By T. Watts-Dunton. | Hope the Hermit. By E. Lyall. |
| Concerning Isabel Carnaby. By E. T. Fowler. | Fatal Gift. By F. F. Moore. |
| Roden's Corner. By H. S. Merriman. | The Battle of the Strong. By Gilbert Parker. |
| The Day's Work. By Rudyard Kipling. | The Changeling. By Sir Walter Besant. |
| Afterwards, and Other Works. By Ian Maclaren. | Daughters of Babylon. By W. Barrett and R. Hichens. |
| The Red Axe. By S. R. Crockett. | Red Rock. By T. Nelson Page. |
| The Sign of the Cross. By Wilson Barrett. | Ashes of Empire. By R. W. Chambers. |
| An Open Question. By C. E. Raimond. | Countess Tekla. By Robert Barr. |
| The Castle Inn. By S. J. Weyman. | Pharos the Egyptian. By Guy Boothby. |
| Wild Eelin. By W. Black. | Mr. Dooley: In Peace and in War. By F. P. Dunne. |
| Windyhaugh. By G. Travers. | The Custom of the Country. By Mrs. H. Fraser. |
| John Splendid. By Neil Munro. | The Martyrdom of an Empress. |
| Gloria Mundi. By Harold Frederic. | |

- Secret History of the Oxford Movement. By W. Walsh.
 The Story of an African Farm. By Olive Schreiner.
 Cricketing Reminiscences. By W. G. Grace.
 Professions for Boys.
 War to the Knife. By R. Boldrewood.
 Rupert, by the Grace of God.
 A South African's View of the Situation. By Olive Schreiner.
 A Semi-Detached Marriage. By A. Kenealy.
 I, Thou, and the Other One. By Amelia E. Barr.
 Son of Empire. By M. Roberts.
 Well, After All—. By F. F. Moore.
 Cousin Ivo. By Mrs. A. Dean.
 The Forest Lovers. By M. Hewlett.
 Idols. By W. J. Locke.
 Scarlet City, etc. By Pot and Swears.
 Round the World on a Wheel. By J. F. Fraser.
 Murder of Delicia. By Marie Corelli.
 The Etchingham Letters. By Maitland and Pollock.
 A Double Thread. By E. T. Fowler.
 No. 5 John Street. By Richard Whiteing.
 The Market Place. By Harold Frederic.
 The Fowler. By Beatrice Harraden.
 Ione March. By S. R. Crockett.
 Mammon and Co. By E. F. Benson.
 The Orange Girl. By W. Besant.
 The King's Mirror. By Anthony Hope.
 Kit Kennedy. By S. R. Crockett.
 Trooper 3809. By Lionel Declé.
 A Solitary Summer.
 Elizabeth and Her German Garden.
 Kipling. 6s. edition.
 The Individualist. By W. H. Mallock.
 Works on Dreyfus.
 The Human Boy. By E. Phillpotts.
 Richard Carvel. By Winston Churchill.
 David Harum. By Edward Noyes Westcott.
 To London Town. By A. Morrison.
 Meiklejohn's History, Geography, etc.
 One Poor Scruple. By Mrs. Ward.
 The Black Douglas. By S. R. Crockett.
 Peter Binney, Undergraduate. By A. Marshall.
 On the Edge of the Empire. By Jepson and Beames.
 The Dominion of Dreams. By Fiona Macleod.
 Doctor Nikola's Experiment. By Guy Boothby.
 An Old Rogue's Tragedy. By Rita.
 Willow the King. By J. C. Smith.
 Love Made Manifest. By Guy Boothby.
 Idylls of the Sea. By F. T. Bullen.
 Swallow. By H. R. Haggard.
 The Game and the Candle. By R. Broughton.
 England's Peril. By W. Le Queux.
 A Duet, with an Occasional Chorus. By A. Conan Doyle.
 The Awkward Age. By Henry James.
 The Victim. Translated from G. D'Annunzio.
 Miranda of the Balcony. By A. E. W. Mason.
 His Darling Sin. By M. E. Braddon.
 Wine on the Lees. By J. A. Stewart.
 The Scarlet Woman. By J. Hocking.
 Embroidery. By W. G. P. Townsend.
 Parker (J.), an Autobiography.
 When the Sleeper Wakes. By H. G. Wells.
 A Fair Fraud. By Mrs. L. Cameron.
 Madam Izan. By Mrs. C. Praed.
 The Garden of Swords. By Max Pemberton.
 The Letters of R. L. Stevenson.
 Red Pottage. By M. Cholmondeley.
 The Slave. By R. Hichens.
 The Colossus. By Morley Roberts.
 The Transvaal from Within. By J. P. Fitzpatrick.
 A Corner of the West. By E. T. Fowler.
 Stalky and Co. By Rudyard Kipling.
 Gilian the Dreamer. By N. Munro.
 Story of Australian Bushrangers. By G. E. Boxall.

The new books published in Great Britain in 1899 numbered 5971. The new editions, 1596—total, 7567.

LLOYD, DANIEL LEWIS, D.D., sometime bishop of Bangor, Wales, died August 4, 1899. He was born November 23, 1843. He became a scholar of Jesus College, Oxford, where he took his master's degree in 1871. From 1867 to 1872 he was headmaster of Dolgelly School and curate of Dolgelly, and from 1873 to 1878 was headmaster of the Friar's School at Bangor. He was headmaster of Christ College, Brecon, from the latter year to 1890, when he was consecrated bishop of Bangor. This position he resigned a short time before his death. Dr. Lloyd published the Welsh hymn book, *Emyniadur yr Eglwys*.

LOCOMOTIVES. See RAILWAYS (paragraph Locomotives).

LOESS. Shimek points out that most of the fossils found in the loess of the central States are land forms of shells, and that this favors the theory of an æolian origin for the loess; another point bearing this way, he says, is that when shells are found in the streams they are always with sandy material and never with the fine silt.

LOGAN, Major JOHN A., only son of the late Major-General John A. Logan. was killed on November 12, 1899, "while gallantly leading his battalion" of the Thirty-third Infantry of General Wheaton's command, in an engagement against the insurgents at San Jacinto, Philippine islands. He fell while leading his men

through an almost impassable barrier against entrenchments of the enemy. Major Logan was born in Illinois July 24, 1865. He was at West Point for two years, but did not graduate owing to poor eyesight. During the Harrison administration he held a consular position abroad. When the Spanish war broke out he at once offered his services, and as a staff officer won commendation in Cuba. On May 12, 1898, he was appointed assistant adjutant-general of volunteers, with the rank of first lieutenant, and in the Santiago campaign served on General Bates's staff. For gallantry in the battle of El Caney he was promoted to the rank of major. After his return from Cuba he was appointed major in the Thirty-third Infantry, U. S. A., and sailed for Manila with his regiment, arriving there on October 27. Major Logan was well known as a breeder of fine horses, but in 1894 he sold his entire stable, comprising nearly two hundred and fifty horses.

LOMMEL, EUGEN VON, German physicist, died in August, 1899, at Munich. He was born March 19, 1837, at Edenkoben in the Palatinate; he studied physics and chemistry at Munich, and in 1860 began teaching in Switzerland. Five years later he became teacher of mathematics in the gymnasium at Zürich; at the same time he lectured in the university and at the Polytechnic School. In 1867 he accepted a call to the professorship of physics in the Academy at Hohenheim, but in the following year he became professor of the same subject in the University of Erlangen. Here he remained until 1886, when he accepted a professorship at Munich, and also took charge of the state physics collection; in Munich also he was a fellow of the Academy of Sciences. His works treated especially of optics. He wrote: *Studien über die Besselschen Funktionen*, 1868; *Wind und Wetter*; *Das Wesen des Lichts*, 1875; *Lexicon der Physik und Meteorologie*, 1882; *Die Beugungserscheinungen einer kreisförmigen Öffnung*, 1884; *Geradlinig begrenzter Schirme*, 1886; *Lehrbuch der Experimentalphysik*, 1893. The vacancy caused in the faculty of the University of Munich by the death of Professor Lommel was filled by Professor Röntgen, of Würzburg, the discoverer of the "Röntgen rays."

LORD, WILLIAM PAINE, United States minister to the Argentine Republic, was appointed to his present position by President McKinley on October 23, 1899, to succeed Mr. William T. Buchanan, resigned. Mr. Lord was born at Dover, Del., in 1838. He was graduated at Fairfield College in 1860, and began the study of the law, but the Civil War having broken out he raised a battalion of Delaware cavalry and entered the Union service. From the rank of captain he was promoted major, and finally became judge advocate on the staff of General Lew Wallace. After the war he resumed his legal studies, and in 1866 was graduated from the Albany Law School and admitted to the bar. He accepted, however, the appointment to a lieutenantcy in the Second United States Cavalry, and served at Forts Steilacoom and Alcatraz, and in Alaska. In 1868 he resigned and began the practice of law in Salem, Ore. Having here acted as city attorney, he served as State senator from Marion County in 1878. For fourteen years he was a Supreme Court justice in Oregon, and, as a Republican, was elected governor in 1894, serving from January, 1895, to January, 1899. On April 18, 1899, Mr. Lord was appointed minister to Persia, to succeed Mr. Arthur S. Hardy, but declined.

LOUBET, ÉMILE, seventh president of the French republic, was elected to succeed President Faure on February 18, 1899, two days after the latter's death. President Loubet was born December 31, 1838, in southern France in the commune of Marsanne, *arrondissement* of Montélimar. His father, a peasant farmer, was a man of good repute, and for many years was mayor of the commune. Young Loubet attended schools near his home, and then studied law at Berguin and Paris. He soon became a successful lawyer, was made counsel for the Paris, Lyons, and Mediterranean Railway, then councillor of the *arrondissement*, and in 1871 councillor-general. Not long afterward he was chosen mayor of Montélimar, and retained that position until his election to the presidency.

During that time, however, he held other offices. He was elected to the chamber of deputies as a Republican of the Left in 1876, 1877, and 1881; in 1885 he was sent to the senate, and two years later was called by M. Tirard to the portfolio of public works in the first ministry under President Carnot. On account of his opposition to the policy of M. Charles Floquet, who succeeded M. Tirard as premier, M. Loubet did not retain his cabinet position the following year. In 1892 President Carnot chose him to succeed M. de Freycinet as premier, and he formed a ministry in which he held the portfolio of the interior. In 1896 and 1898 he was elected to the presidency of the senate. He held this office when, on February 16, 1899, President Faure suddenly died; on the 18th the national assembly (consisting of the senate and the chamber of deputies) convened at Versailles, and on the first ballot elected M. Loubet by a vote of 483 against 279 for M. Méline (who, however, had withdrawn his candidacy), 45 for M. Cavaignac, and 5 scattering. M. Loubet was

supported by the Liberals, or Republicans of the Left, while the Progressive Republicans favored M. Méline. M. Loubet was succeeded as president of the senate by M. Eugène Fallières. The new president of the republic is said to be a man of patriotism, integrity, and firmness, and his choice was looked upon as a wise one. About the time of his election he was reproached with the epithet "Panamist"—a reference to his official refusal immediately to make public the details of the Panama scandal when that affair was discovered. In no way was M. Loubet personally involved in the scandal, and his decision to suppress for a time the details was doubtless a wise measure for preventing popular outbursts, not to say an insurrection in favor of one of the pretenders. On June 4, 1899, a violent demonstration was made against President Loubet by anti-Semites at the Auteuil race-course. For a further account of the president in relation to the history of France during the year, see the article FRANCE. The president's mother, who has reached the age of eighty-six, still lives on the farm at Marsanne.

LOUISIANA, a Gulf State of the United States, has an area of 48,720 square miles. The capital is Baton Rouge. Louisiana was admitted to the Union April 30, 1812.

Agriculture.—During 1899 the rice industry was favored with exceptionally encouraging conditions. The blizzard in February, which was exceedingly disastrous to the sugar-cane, orange, and fig interests, was beneficial to rice, and planters put a larger area in that cereal than ever before. As the season wore on it became evident that the crop would equal, if not exceed, that of 1892, the record-breaking year. It is interesting to note that within fifteen years the rice industry has developed a section of the State previously considered worthless. The population was quadrupled, and the wealth increased twenty-fold. This condition is largely due to the development and improvement of an irrigating system, which now comprises 84 canals extending hundreds of miles through the rice district, and assures an ample supply of water, as each canal is capable of irrigating from 1000 to 20,000 acres of land. (See IRRIGATION.) The crop of 1898 was 800,000 bags, and that of 1899 promised 2,000,000 bags. During 1899 orange-growers generally took advantage of the blizzard to restock their groves with species that had resisted the frost. It was proven that the mandarin, tangerine, salsuma, ooushin, and gumquat, all Japanese varieties, escaped injury when properly cared for; and the blizzard that killed fully half of the bearing trees was regarded as a real benefit in that it showed what varieties should be grown. The cotton acreage of 1899 was 1,281,691, and the production was 717,747 bales. See COTTON AND THE COTTON INDUSTRY.

Manufactures.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$2,163,331. There were 68 manufacturers of tobacco and 155 of cigars, and the total output was 48,078,541 cigars, 97,109,710 cigarettes, 1,477,865 pounds of smoking tobacco, and 35,788 pounds of snuff. Distilleries in operation numbered 11; the amount of spirits rectified was 950,979 gallons; distilled spirits gauged, 3,290,582 gallons; and production of fermented liquors, 193,761 barrels. Discoveries in 1899 lead to the belief that a large part of the coast, especially the area from Belle Isle to Abbeville, a distance of 55 miles, and extending inward from the gulf, a distance of 20 miles, lies over a solid bed of rock salt from 40 to 80 feet deep. Prior to 1898 the salt industry was confined to Avery Island, near New Iberia. In 1899 operations were begun on Weeks, Jefferson, and Belle islands, where salt was found in extensive quantities, and valuable discoveries were made in Vermilion, Iberia, and St. Mary parishes. Salt was found in so many places where its existence had not been suspected that the State geologist was directed to ascertain the extent of the new territory so underlaid, and to map the entire area. The Frasch process of liquefying the sulphur near Lake Charles by superheated water not having proved the commercial success its promoters anticipated, operations were suspended in 1897. In 1899 it was understood that an attempt would be made to recover the large known amount of sulphur by a chemical process.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the port of New Orleans aggregated in value \$11,907,659, an increase in a year of \$1,243,202; and the exports, \$88,182,878, a decrease of \$24,643,803. The movement of gold and silver coin and bullion was, imports, \$624,497; exports, \$6196—making the total foreign trade in the year \$100,721,230.

Railways.—The new railway construction during 1898 was 160.38 miles, and during 1899, 158.30, giving the State a total mileage of 2677.74.

Banks.—On October 31, 1899, there were 20 national banks in operation and 8 in liquidation. The active capital aggregated \$3,260,000; circulation, \$1,423,848; deposits, \$19,040,541, and reserve, \$5,229,130. The State banks, June 30, 1899, numbered 50, and had capital, \$3,415,550; deposits, \$10,827,205, and resources, \$15,852,550; and stock savings banks, 3, with capital, \$300,000; depositors, 10,094; deposits, \$3,105,461, and resources, \$3,839,734. The exchanges at the United States clearing-

house at New Orleans in the year ending September 30, 1899, aggregated \$442,659,109, a decrease of \$2,423,380 in a year.

Education.—The school census of 1897 gave a total enumeration of 434,180, and at the close of the school year 1897-98 the enrolment in the public schools was 182,341, and the average daily attendance, 132,046. There were 3834 teachers, 3055 buildings used as school-houses, and public school property valued at \$1,066,000. The revenue was \$987,046; expenditure, \$956,888, of which \$746,690 was for teachers' salaries. There were 20 public high schools, with 88 secondary teachers, 1755 secondary students, and 512 elementary pupils; 25 private secondary ones, with 87 secondary teachers, 987 secondary students, and 1913 elementary pupils; 2 public normal schools, with 26 teachers and 797 students; and 1 private one, with 16 teachers and 272 students. Normal training was also given in 2 colleges and 2 public high schools. Nine colleges and universities for men and for both sexes reported 194 scholarships, 166 professors and instructors, 1917 students, 71,700 volumes in the libraries, valued at \$69,500; \$126,250 invested in scientific apparatus, \$1,845,000 in grounds and buildings, and \$1,947,313 in productive funds, \$214,974 in total income, and \$7800 in benefactions. Two colleges for women reported 21 professors and instructors, 186 students, \$75,000 in grounds and buildings, \$31,000 in productive funds, \$14,950 in total income, and \$2000 in benefactions. In 1899 there were 183 periodicals, of which 18 were dailies, 142 weeklies, and 14 monthlies.

Finances.—The aggregate assessed valuation in 1898 was \$261,545,868, at the rate of 37 per cent. of actual value, an increase in a year of \$1,747,655. On April 1, 1899, the total interest-bearing bonded debt was \$10,877,800; floating debt, \$914,397; unrecognized bonds not fundable, \$3,953,000.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 1,310,000.

A New Weather Record.—On February 12, 1899, three inches of snow fell in New Orleans, and the thermometer went down to 7°. This amount of snow was unprecedented in that locality, and the temperature was more than 10° below the lowest ever recorded. The festivities of the Mardi-Gras carnival on February 14 were, therefore, for the first time in the history of New Orleans celebrated in the midst of snow and ice.

State Officers and National Representatives.—Governor, Murphy J. Foster; lieutenant-governor, R. H. Snyder; secretary of state, John T. Michel; treasurer, A. V. Fournette; auditor, W. W. Heard; attorney-general, M. J. Cunningham; superintendent of education, J. V. Calhoun; adjutant-general, Allen Jumel; commissioner of agriculture, Leon Jastremski; commissioner of insurance, John T. Michel. Supreme Court: Chief justice, F. T. Nicholls; associate justices, Newton C. Blanchard, Lynn B. Watkins, Joseph A. Breaux, Frank A. Monroe; clerk, T. McC. Hyman. The State legislature consists of 88 Democrats, 31 Republicans, and 15 Populists; a new legislature will be elected in April, 1900. Senators: Donelson Caffery, from Franklin; Samuel D. McEnery, from New Orleans, both Democrats. Representatives: Adolph Meyer, from New Orleans; Robert C. Davey, from New Orleans; Robert F. Broussard, from New Iberia; Phanor Brezeals, from Natchitoches; Joseph E. Ransdell, from L. Providence (*vice* Samuel T. Baird, who died April 22, 1899); S. M. Robertson, from Baton Rouge—all Democrats.

LOW, SETH, LL.D., president of Columbia University, was appointed by President McKinley a member of the American delegation to the peace conference which met at The Hague in May, 1899. The appointment of the delegation was announced by Secretary of State Hay on April 6, 1899. Mr. Low was born in Brooklyn, N. Y., January 18, 1850; after his graduation at Columbia, in 1870, he began the study of law, but soon left it to enter his father's business, tea-importing, and later became a member of the firm. From 1881 to 1885 he was mayor of Brooklyn, being elected as an independent, and his administration was conducted with ability and integrity. He became president of Columbia College in 1890, and was largely instrumental in reorganizing the institution on a university basis. In 1895 he presented to the university the magnificent library building, estimated to cost \$1,000,000. Mr. Low was a member of the New York Rapid Transit Commission and the Greater New York Commission. In the fall of 1897 he was the Citizens' Union candidate for first mayor of the greater city, and was defeated by Mr. Robert A. Van Wyck, the Tammany Democratic nominee. The vote for the three principal candidates was: Van Wyck, 228,531; Low, 148,215; General Benjamin F. Tracy, Republican, 101,994. Mr. Low is president of the Archaeological Institution of America, and vice-president of the New York Academy of Sciences.

LOWRY, Rev. Dr. ROBERT, who died November 25, 1899, was a Baptist clergyman, well known as the author of many hymns and other church music. He had written numerous Easter and Christmas services and single songs, and edited a large number of hymn and Sunday-school song collections. The sales of copies of his com-

positions have been large. He was born in Philadelphia in 1826, and graduated in 1854 from Lewisburg (now Bucknell) University, Lewisburg, Penn., of which institution he was professor of belles lettres, 1869-75, and chancellor, 1876-82. He delivered numerous lectures throughout Europe and America. His last pastorate was at Plainfield, N. J.

LOYAL LEGION, MILITARY ORDER OF THE, founded in 1865 by officers and ex-officers of the army, navy, and marine corps who served in the Civil War, had in 1899 a membership of 9099. Commander-in-chief, Lieutenant-General John M. Schofield; registrar-in-chief, Brevet-Major William P. Huxford, Atlantic Building, Washington, D. C.

LUDLAM, REUBEN, an eminent homœopathic physician, died April 29, 1899. He was born at Camden, N. J., October 7, 1831; after his graduation from the medical department of the University of Pennsylvania in 1852 he studied in Europe. Returning to America, he built up a practice in Chicago as a homœopath. He was connected with the Hahnemann Medical College and Hospital from the time of its organization in 1860; in this institution he became dean and clinical professor of the surgical diseases of women. In 1870 he was made president of the American Institute of Homœopathy, and president of the Chicago Academy of Medicine in 1873. From 1877 to 1887 he was a member of the Illinois Board of Health. Among Dr. Ludlam's publications are: *Clinical Lectures on Diphtheria and Clinical and Didactic Lectures on the Diseases of Women*.

LUDLOW, Baron, Rt. Hon. HENRY CHARLES LOPES, K.B., died December 25, 1899, at the age of 72 years. He was formerly recorder of Exeter, and judge of the Court of Appeals. He graduated from Balliol College, Oxford, with honors, and in 1852 was called to the bar in the Inner Temple. He became a Queen's counsel, served in the House of Commons from 1868 to 1876, and then was made a judge of the High Court of Justice. He sat in the Court of Appeal from 1885 to 1897, when he was raised to the peerage at the Queen's diamond jubilee. In 1890 he was appointed treasurer of the Queen's Temple, and in 1895 chairman of the Wiltshire Quarter Session. The heir to the title was his son, Henry Ludlow Lopes.

LUPUS. See ROENTGEN RAYS.

LUQUIENS, JULES, head of the department of French in Yale University, died at Salem, O., August 25, 1899, at the age of 53 years. He was born in Switzerland, and his early life was passed there. Before being called to Yale he was a teacher in a university on the Franco-Swiss border line. When Professor William Knapp went to the University of Chicago in 1891 Professor Luquiens became head of the French department.

LUTHERAN CHURCH IN THE UNITED STATES is composed of four general bodies, fifteen independent synods, 200 independent congregations, and the sect called Waldenstromians. The general bodies are (I.) the General Synod, with 1207 ministers, 1545 churches, and 195,860 communicants; (II.) the United Synod in the South, with 214 ministers, 412 churches, and 39,107 communicants; (III.) the General Council, with 1228 ministers, 2011 churches, and 352,484 members; and (IV.) the Synodical Conference, with 1957 ministers, 2525 churches, and 520,785 members. The fifteen independent synods are the Missouri Synod, the United Norwegian, the Joint Synod of Ohio, the Buffalo Synod, Hauge's Synod (Norwegian), the Texas Synod, the German of Iowa, the Norwegian Lutheran, the Michigan, the Danish in America, the Icelandic, the Immanuel Synod, the Soumai (Finnish), the Norwegian Free, and the Danish United. The total number of Lutheran ministers in the United States is 6685, of churches 10,991, and of communicants 1,575,778. The Waldenstromians number 140 ministers, 150 churches, and 20,000 communicants. The Lutherans report much progress in the organization of missions in New York City, Buffalo, Rochester, Utica, Baltimore, and other cities. Several missionaries have been sent to Puerto Rico. The United Synod in the South has founded a theological seminary at Mount Pleasant, S. C. A notable publication during 1899 was the Lutheran Cyclopædia, edited by Dr. Jacobs and the Rev. J. A. W. Haas. The latest report of the United States commissioner of education shows the Lutherans to have 24 institutions of learning, with 189 professors, 1864 students, and endowment funds aggregating \$917,168.

LUTHER LEAGUE, a society of young people of the Lutheran Church, established for the furtherance of greater Christian activity. The society was founded in 1888, the first convention was held in 1895, and in 1899 there was an estimated membership of 70,000. President, E. F. Eilert; secretary, C. G. Grauer, Buffalo, N. Y.

LUXEMBURG is a grand duchy of Europe, with an area of 998 square miles, bounded by Germany, Belgium, and France. The inhabitants, census of 1895, number 217,583, the majority of whom are Catholics. Luxemburg, a city of 20,000 inhabitants, is the capital. The duchy of Luxemburg formed part of the German confed-

eration from 1815 to 1867; in the latter year it was declared, by the treaty of London, to be neutral territory, and was placed under the sovereignty of the King of the Netherlands. Upon his death in 1890 it passed to the present executor, the Duke of Nassau. There is also a legislature, the chamber of deputies, the 45 members of which are chosen directly by the cantons for six years. For commercial purposes the duchy is a member of the German Zollverein.

LYDDITE, a modern high explosive. It takes its name from Lydd, Wales, where the first experiments were made with it. Lyddite is the special explosive used by the British, and has attracted considerable interest since the beginning of the war with the Boers. Its method of manufacture is preserved as a secret by the British Bureau of Ordnance, but the best authorities believe it to be partly or wholly picric acid. Unlike explosives such as gun-cotton, lyddite is used as a filler—that is to say, it is poured in a liquid state into shells. A recent authority says of it that it is “simply picric acid brought into a dense state by fusion.” The shells are coated inside with a special varnish, and the melted picric acid is cast into them. As this explosive requires a strong detonator, or very powerful primer, the British government is said to have adopted a primer of picric acid, which consists of a mixture of two parts of ammonium picrate to three parts of saltpetre, manufactured in much the same way as ordinary granulated gunpowder. This is then set off by the ordinary service fuse. Among the characteristics of lyddite may be mentioned as most important its stability—that is to say, it is not affected by ordinary changes of temperature, remaining permanent under the influence of both cold and heat. Whenever it is exploded it is said that the effects of its influence are six or seven times as great as those of black powder on compact rock or masonry, and one and one-half to two times as great in earth. A shell filled with lyddite will break the most solid and resisting plates of steel. Not only is the projectile scattered in small fragments, but all objects within the radius of action are likewise shattered. The radius extends only from 20 to 25 yards, but those who are unfortunate enough to be found within it, even if they are not touched by the fragments, will be suffocated by the blast of gas produced by the explosion. It is this latter feature that has caused considerable comment during the war in Africa. The dense fumes of yellowish green gas, resulting from the decomposition of the picric acid compound, suffocating those who come in contact with it, and staining articles with the yellow color, has been referred to in graphic terms by correspondents and others who have written of its effects at Ladysmith and elsewhere in South Africa. The use of lyddite was originally restricted to 5-inch Howitzer guns, but has recently been extended to guns of higher calibre, and the announcement has been made that lyddite shells are to be supplied to the guns mounted in the forts of the English sea fronts. It has also been decided that the 5-inch Howitzers are to be permanently supplied with lyddite shells, and orders have been issued that no more shrapnel shells are to be made for those guns. The now famous naval guns used by the British during the siege at Ladysmith were provided with shells containing lyddite.

McCOMAS, LOUIS EMORY, United States senator from Maryland, was elected, as a Republican, to succeed Senator Arthur P. Gorman, Democrat. Born in Washington County, Md., October 28, 1846, he was educated at St. James's College (Maryland) and Dickinson College, being graduated at the latter in 1866. He studied law, and in 1868 was admitted to the bar. In 1882 he was elected to the Forty-eighth Congress, and was returned to the following three Congresses. In 1893 President Harrison appointed him associate justice of the Supreme Court of the District of Columbia, and in this capacity he served until 1899. Since 1895 Judge McComas has occupied the chair of evidence and contracts in the Georgetown University Law School. His term in the Senate will expire March 3, 1905.

McCONNELL, JAMES, editor and part proprietor of the Philadelphia *Evening Star*, died December 6, 1899, at the age of 55 years. He was at one time Albany correspondent of the New York *Tribune*, under Horace Greeley, and he also, under the latter's régime, acted successively as political editor, night editor, and city editor of the *Tribune*. In his earlier career he succeeded the late John Russell Young as copy-holder on the Philadelphia *Press*, and later, under Mr. Young's editorship, was made a war correspondent of the *Press*.

MacCORMAC, Sir WILLIAM, M.A., D.Sc., president of the Royal College of Surgeons, volunteered for surgical work in 1899 in the Boer war. Born at Belfast, Ireland, January 17, 1836, he was educated in that city and at Dublin and Paris. He was a surgeon to the Anglo-American Ambulance in the Franco-German war, and was present at the battle of Sedan. In 1881 he was knighted, and in 1897 made a baronet. He is a member of a large number of medical societies both in England and on the continent, and has received the decorations of several foreign orders, including that of an officer in the Legion of Honor. Besides various lectures and papers he

has published: *Antiseptic Surgery; Surgical Operations; Notes and Recollections of an Ambulance Surgeon.*

MC'COY, Sir FREDERICK, K.C.M.G., professor of natural science in Melbourne University, died May 15, 1899. Born in 1823 and educated for the medical profession at Dublin and Cambridge, he became, however, professor of geology and mineralogy in Queen's University, Ireland, in 1854. He held the degrees M.A., D.Sc., and F.R.S., and was created a K.C.M.G. in 1891. With Sedgwick he wrote *British Palaeozoic Rocks and Fossils.*

McCUMBER, PORTER J., United States senator from North Dakota, was elected, as a Republican, by the legislature, to succeed Senator William N. Roach, Democrat, January 20, 1899. Born at Crete, Ill., February 3, 1856, he was graduated in law at the University of Michigan in 1880, and the following year went to North Dakota, where he began the practice of law. In 1885 and 1887 he was a member of the territorial legislature. His term in the Senate will expire March 3, 1905.

MACDONALD, HECTOR ARCHIBALD, aide-de-camp to Queen Victoria, who succeeded General Wauchope in command of the Highland Brigade in South Africa in December, 1899, was born in Ross-shire, Scotland, April 13, 1852. He joined the Gordon Highlanders in 1870 as a private, and served over nine years, attaining some distinction in the Afghan war (1879-80), and was mentioned in despatches for his behavior at Karatiga. He served in the Maiden expedition of 1880; accompanied Lord Roberts in his famous march to Kabul; and was promoted lieutenant for his distinguished conduct at the battle of Kandahar, receiving also a medal and clasps. As lieutenant he took part in the Boer war of 1881, and was present at Majuba Hill. Here he was also mentioned in despatches. In 1885 he was in the Nile expedition, and, promoted captain in the Gordon Highlanders in 1888, took part in the engagement of Suakim, where he was again mentioned in despatches and received a medal, clasp, and the Khedive's star. In July, 1891, he became major in the Royal Fusiliers. He commanded the third infantry brigade of Lord Kitchener's Dongola expeditionary force, and was promoted to lieutenant-colonel, mentioned in despatches, and given the Khedive's medal with clasps. In 1898, as brigadier-general in the Egyptian army, he was appointed to command the Soudanese brigade, and distinguished himself as a leader at the battles of Atbara and Omdurman. On the death of General Wauchope he was transferred from India to South Africa to command the Highland brigade as major-general.

MACDOWELL, EDWARD ALEXANDER, American composer, born in New York, December 18, 1861, studied the piano at an early age under Teresa Carreño and others, and in 1876 went to Paris, where he studied the piano under Marmontel and composition under Savard. He also studied composition under Joachim Raff. In 1881-84 he was a teacher of the piano in the Darmstadt Conservatory. In 1884-88 he lived in Wiesbaden, where he had previously resided in 1879-81. In 1888 he went to Boston, remaining there until he was called to fill the chair of music in Columbia College, created in 1895. In 1899 he became president of the Manuscript Society of New York. He is also director of the Mendelssohn Glee Club. Mr. Macdowell is an excellent concert pianist and has composed concertos, sonatas, and many pieces for his instrument. His *Woodland Sketches* and *Sea-Pictures* are especially admired. His orchestral compositions, which take high rank among modern works, include an *Indian Suite*, constructed on themes from the Sioux tribes. Princeton gave him the degree of Mus. Doc. in 1896.

MACEDONIA. See BULGARIA.

McENROE, WILLIAM HALE, M.D., for many years professor of materia medica in the medical school of the University of the City of New York (now New York University), was born in Charlottesville, Va., August 15, 1854, and died in New York City, May 17, 1899. He had been elected to a chair in the recently established Cornell Medical College. He wrote *Materia Medica and Therapeutics.*

MACFARLAN, Lieutenant-General DAVID, C.B., died June 23, 1899. Born in Calcutta, August 30, 1833, and educated at the Edinburgh Academy and College and at Addiscombe College, he entered the Bengal Artillery in 1853. He served through the Indian mutiny on the northwest frontier in the campaign of 1864, and in the Afghan war of 1878-79. He was decorated for meritorious services in India.

McGIFFERT, ARTHUR CUSHMAN, D.D., since 1893 professor of church history in the Union Theological Seminary, New York City. In May, 1898, the general assembly of the Presbyterian Church considered charges of heresy against Dr. McGiffert. The charges were based on his book, *A History of Christianity in the Apostolic Age*, in which, it was alleged, were embodied heretical teachings on the inspiration of the Bible, the divinity of Christ, and the Lord's Supper. The assembly requested Dr. McGiffert to reconsider his views, and if he then felt unable to with-

draw them to leave the church voluntarily. This Dr. McGiffert declined to do, on the ground that his teachings were in no way inconsistent with the essential doctrines of the Presbyterian Church. The question was brought before the New York Presbytery in December, 1899, when that body voted that the best interests of the church required the Presbytery to disavow Dr. McGiffert's teachings, but to pursue no further action. One of the members gave notice, however, that he would prefer formal charges of heresy, and the defendant was cited to appear before the Presbytery on February 12, 1900. The indications were, however, that the Presbytery would on that day decide that he should not be brought to trial.

MACKENZIE, Rev. JOHN, missionary, died at Kimberly, South Africa, March 23, 1899. He worked in the same sphere as Dr. David Livingstone and Dr. Robert Moffat. Mackenzie fought for the Bechuana natives against the Boers, and preceded Mr. Cecil Rhodes as deputy commissioner of Bechuanaland.

McLELLAN, ISAAC, who was known as the "sportsman's poet," died August 20, 1899, at his home in Greenport, L. I. He was born in Portland, Me., May 21, 1806; he studied at Phillips Academy, Andover, where N. P. Willis was his roommate and Oliver Wendell Holmes a fellow-student. When their preparatory work was ended Willis went to Yale and McLellan to Bowdoin; here the latter was graduated in 1826, his class being one year behind that of Hawthorne, Longfellow, and Franklin Pierce. His acquaintance here with Longfellow ripened into a lifelong friendship. After graduation he studied law, was admitted to the bar, and practised for a number of years in Boston. Continuing his association with literary men, he wrote for the magazines and became associate editor of the *Daily Patriot*, and subsequently began the publication of the *Pearl*, a monthly. In 1851 he removed to New York, and thereafter was interested chiefly in literary work and in field sports. Sportsmen will remember him especially for his *Poems of the Rod and Gun*; before the publication of this book he wrote *The Year, and Other Poems*; *The Fall of the Indian*, and *Mount Auburn*. He also wrote *Haunts of Wild Game*; his last work was entitled *War Poems*. Among his best known compositions are *The Trout Brook*; *Napoleon*; *New England's Dead*, and *The Notes of the Birds*.

McMANES, JAMES, a prominent Republican leader of Philadelphia, died November 24, 1899, at the age of 77 years. He came from Ireland at the age of 8 years. After the Civil War he became an influential member of the Philadelphia Republican political machine. He was president of the People's Bank, which failed in 1898 by reason of a defaulting cashier, and which involved prominent Pennsylvania officials in scandal for the alleged use of State money in speculation. McManes came to the rescue of the bank's depositors with a promise to personally assume its liabilities, and on June 14, 1898, he turned over to the receiver \$400,000 with which to pay the bank's obligations. His actual obligation on his holdings of stock were said to be not more than \$125,000.

MADAGASCAR, lying in the Indian Ocean, off the southeastern coast of Africa, from which it is separated by the Mozambique Channel, is one of the largest islands in the world. It is possessed by France, who laid claim to it as early as 1642, though little was done until recent years either to make good the claim or to develop the country. In 1882-85 France compelled the recognition of her authority by the natives in a part of the island, and having secured Diégo-Suarez, established a resident-general and assumed the right of control. This right was recognized by foreign governments, but not by the native government until ten years later, when a French expedition to the interior of the island compelled the submission of the Queen. This was followed in 1896 by the formation of the colony of Madagascar, and in 1897 by the deposing of the Queen, who was exiled to Réunion Island (*q. v.*). The colony is administered by a governor-general, General Gallieni in 1899, aided by an administrative council at the capital city, Antananarivo.

The total area of Madagascar is about 228,500 square miles, the island being 975 miles long and 355 miles in extreme breadth. The population is variously estimated at from 2,500,000 to 5,000,000, the most important element of which is the Hovas, a race allied to the Malays, and having considerable intelligence. The Hovas, together with the Saklavas, who are also very numerous, number about 2,000,000. Other races include the Betsiléos, the Baras, the Betsimisarakas, etc. The foreign population is mostly Asiatic, with a few Europeans, for whom the climate is unhealthy. Antananarivo has a population of 100,000, and Tamatave, on the east coast, which is the chief port of the island, has a population of about 10,000. As to religion and education, missionary enterprise has afforded better facilities than might be expected. Through the efforts of representatives of the Christian church there are said to be among the natives some 450,000 Protestants and 50,000 Roman Catholics, and 170,000 children are reported as being educated at the various schools the products of the former including rice, caoutchouc, sugar, coffee, cotton, and connected with missions. Agriculture and cattle-raising are the chief occupations,

sweet potatoes; mineral resources include copper, gold, iron, lead, sulphur, graphite, and lignite. Valuable woods abound in the forests. The commerce includes an export trade in coffee, sugar, rice, seeds, caoutchouc, vanilla, gum copal, wax, lard, cattle, hides, horns, gold dust, and ebony. The principal items of import are cotton cloth, tinware, iron ware, tobacco, wines, and beer. The increase of tariff on goods coming from countries other than France is said to have caused depression in trade, especially in cotton goods, the duty on which is between 50 and 60 per cent. of their value. (See FRANCE, paragraphs on History.) England has the largest import trade into Madagascar, followed in the order of importance by France, the United States, and Germany. There is a popular demand for United States cottons, especially soft-finished textiles, which are said to be highly appreciated by the natives. Most of the imports enter through Tamatave, which has an excellent harbor, although the port of Majunga (population, 14,000), on the northwest coast, has a good trade with Mauritius and Réunion. Good roads from Tamatave to the interior have never existed, but the French government in 1898 granted concessions to a company to build a canal from that port to Andevorante, and a railway to the capital is projected as well as to Ivondro. Tamatave is connected by telegraph with the capital, Antananarivo. In 1899 Great Britain entered a protest against the discriminations claimed to have been made against British trade in Madagascar by reason of the French tariff regulations. From 10 per cent. *ad valorem* the duty was raised to 45 per cent., and later to 55 per cent. on the principal imports, and some of the articles sent into the island by Great Britain pay nearly 80 per cent. On the other hand, French imports are taxed only 3 per cent., and some articles from France are said to be admitted free. Of course, a country has the power to levy what duties it may on its colonial trade, but Great Britain's claim is based on an understanding made with France at the time Great Britain recognized the latter's suzerainty over Madagascar, whereby British trade with that island, which is considerable, especially in its Indian branch, was not to be interfered with.

On November 28 a bill was introduced into the French parliament authorizing the colony of Madagascar to issue a loan of 60,000,000 francs for the construction of a railway from Antananarivo to the eastern coast and for the carrying out of public works.

MAGNESITE. The production in the United States in 1898 was 1263 short tons, valued at \$19,075, and came chiefly from California. Magnesite bricks are manufactured at several localities in the Eastern States, but the product comes mainly from Europe.

MAHAN, ALFRED THAYER, Captain, U.S.N., retired, an authority in naval strategy, was appointed by President McKinley a member of the American delegation to the peace conference which met at The Hague in May, 1899. The appointment of the delegation was announced by Secretary of State Hay on April 6, 1899. Captain Mahan was born September 27, 1840, at West Point, N. Y., where his father, D. H. Mahan, was professor of military engineering in the Military Academy. Appointed to the navy in 1856, he was graduated from the Naval Academy at Annapolis in 1859. He was assigned to duty in Brazilian waters, from which he returned at the outbreak of the Civil War, and served on the *Congress* and *Pocahontas*. He was promoted to a lieutenantancy in 1861, was instructor for a year in the Naval Academy, and then resumed sea duty, continuing until the end of the war on the *Seminole* and *James Adger*. In 1865 he was made lieutenant-commander, subsequently was advanced to the rank of commander, 1872, and captain, 1885, and on November 17, 1896, was retired at his own request. During this time he saw a large amount of service both on sea and shore. He was attached at various times to the Gulf, South Atlantic, Pacific, Asiatic, and European squadrons, the New York Navy Yard, the Boston Navy Yard, and the Naval Academy at Annapolis. Captain Mahan was president of the Naval War College at Newport, R. I., in 1886-89 and 1892-93, and in the last-named year was given command of the *Chicago* in the European squadron, which position he held until his retirement in 1896. The Spanish-American war occasioned his recall to active duty in May, 1898, as a member of the Naval Advisory Board. Captain Mahan is recognized as one of the greatest authorities on naval strategy, and his fame rests largely upon the philosophy of naval history which he has set forth in several volumes. His publications include: *The Influence of Sea Power upon History*, 1890; *The Life of Admiral Farragut*, 1892; *The Influence of Sea Power upon the French Revolution and Empire*, 1892; *The Life of Nelson, the Embodiment of the Sea Power of Great Britain*, 1897; *The Interest of America in Sea Power, Present and Future*, 1897; *Lessons of the Spanish-American War*, December, 1899. His works have had an extraordinary sale for books of their character, and several of them have been translated into French, German, and Japanese. He has received the degree of LL.D. from Cambridge, Harvard, and Yale, and that of D.C.L. from Oxford.

MAINE, a New England State, has an area of 33,040 square miles. The capital is Augusta. Maine was formerly a part of Massachusetts, and was admitted to the Union as a State, March 15, 1820.

Manufactures, etc.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$346,866. There were 94 tobacco factories in operation, which had a combined output of 5,210,606 cigars. The year 1899 was a remarkable one in the lumber industry. The surveyor-general of the port of Bangor reported that from January 1 till December 1 there was surveyed at the port 174,012,809 feet of lumber of all kinds, and that the survey for December would increase this total by 4,000,000, making the year's survey 178,012,809 feet, an excess of nearly 34,000,000 feet over 1898, and with one exception the largest since 1872. For the first time in twenty-five years the Penobscot River was swept bare of logs and lumber. From the army of men in the woods it was estimated that the winter cut of 1899-1900 would be from 190,000,000 to 200,000,000 feet on the Penobscot and about 150,000,000 feet on the Kennebec. The annual report of the State commissioner of labor, treating of the wood pulp industry, shows that, counting ground wood pulp mills, sulphite mills, and paper mills separately, there were 58 pulp and paper mills in the State, 30 pulp and 28 paper. These were comprised in 37 different plants, employing 5902 operatives, paying over \$5,000,000 per annum in wages, using wood valued at \$2,500,000, and having an output of 1835 tons of pulp and paper daily, or an aggregate of 550,500 tons per annum. The capital invested in the joint industry was over \$30,000,000, and the annual product was worth nearly \$18,000,000. The ship-building industry also showed a remarkable development. At the close of 1899 the number of vessels on the stocks or under contract to be built during 1900 was much greater than for many years, and the new shipping launched during the year was about 50,000 tons. Steel ship-building at Bath has now become a firmly established industry. There are now on the stocks there the United States torpedo-boats *Dahlgren* and *Craven*, and the training ship *Chesapeake*, and the Bath Iron Works has the contract to build two of the new monitors. Quarrying during the calendar year 1898 yielded granite to the value of \$1,032,621; slate, \$199,237; and limestone, \$1,283,468—total, \$2,515,326.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the various ports aggregated in value \$2,074,332, an increase in a year of \$232,077; and the exports, \$13,778,305, an increase of \$5,008,752. The movement of gold and silver, all at the port of Bangor, was, imports, \$267,986; exports, \$1346, making the total foreign trade of the year \$16,121,069.

Railroads.—The new construction during 1898 was 124 miles, and during 1899 40.40 miles, giving the State a total mileage of 1,920.38.

Banks.—On October 31, 1899, there were 82 national banks in operation, and 17 in liquidation. The active capital aggregated \$10,971,000; circulation, \$5,742,678; deposits, \$21,206,244; and reserve, \$7,476,584. The loan and trust companies, April 29, 1899, numbered 17, and had capital, \$1,597,619; deposits, \$7,162,665; and resources, \$10,023,364; and the mutual savings banks, 51, with depositors, 173,509; deposits, \$62,583,435; and resources, \$65,932,907. The exchanges at the United States clearing-house at Portland in the year ending September 30, 1899, aggregated \$78,024,719, an increase of \$5,229,496 in a year.

Education.—At the close of the school year 1897-98, the school population was 209,713; enrolment in the public schools, 134,405; and average daily attendance, 97,616. There were 6727 teachers, 4113 buildings used as school-houses, and public school property valued at \$4,225,401. The revenue was \$1,619,922; expenditure, \$1,614,330, of which \$1,104,796 was for teachers' salaries. There were 154 public high schools, with 332 secondary teachers, 8568 secondary students, and 1857 elementary pupils; 35 private secondary schools, with 146 teachers, 2885 secondary students, and 396 elementary pupils; 4 public normal schools, with 32 teachers and 1011 students in all departments; and 2 private ones, with 7 teachers and 200 students. Normal training was also given in one college and 8 public high schools. Four colleges and universities for men and for both sexes reported 8 fellowships, 218 scholarships, 108 professors and instructors, 1227 students, 129,682 volumes in the libraries, valued at \$162,550; \$143,625 invested in scientific apparatus, \$1,091,566 in grounds and buildings, and \$1,661,512 in productive funds; \$213,106 in total income, and \$114,500 in benefactions. Two colleges for women reported 16 professors and instructors, 326 students, 10,892 volumes in the libraries, \$230,000 invested in grounds and buildings and \$142,000 in productive funds; \$18,325 in total income; and \$5600 in benefactions. In 1899 there were 179 periodicals, of which 17 were dailies, 113 weeklies, and 38 monthlies.

Finances.—The assessed valuations in 1898 were: Real estate, \$260,841,021; personal property, \$68,675,223—total, \$329,516,244, an increase over the total of 1896 of \$1,015,250; tax rate, \$2.75 per \$1000. On January 1, 1899, the bonded debt was

\$2,203,000, a decrease in a year of \$50,000, and there was a temporary loan of \$150,000, against a similar one in 1898 of \$200,000.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 694,000.

Legislation.—The following additions were made to the list of misdemeanors: To advertise for sale debts, dues, accounts, or demands owing by any person, unless the party advertising is an executor, trustee, sheriff, or other official; to desecrate the national or the State flag by using it for advertising purposes, by trampling upon it, or by mutilating it; and ticket "scalping," none but agents of railroads being allowed to sell personal or limited tickets, and when these are unused they must be redeemed by the company. Any person who entices or assists any member of the crew of any vessel to desert may be punished by fine and imprisonment. Interest on personal loans with pledge of personal property was limited to the rate of 3 per cent. monthly for three months and 15 per cent. per annum thereafter on sums of \$200 or less. Library commissioners will be appointed by the governor to encourage free public libraries, and to select books to be bought for travelling libraries; and books may be loaned from the State Library to citizens and to free libraries. A State Board of Commissioners of Pharmacy was created to examine and license all apothecaries. Soldiers and sailors serving as volunteers will be given extra pay by the State; they will be reimbursed for any outlays for doctors and nurses, and a limited amount will be paid for funeral expenses. Pensions will be paid by the State to those who served either in the Civil War or the war with Spain, and are disabled and unable to make a living.

State Officers and National Representatives.—Governor, Llewellyn Powers; secretary of state, Byron Boyd; treasurer, F. M. Simpson; adjutant-general, John T. Richards; attorney-general, William T. Haines; superintendent of education, W. W. Stetson; insurance commissioner, S. W. Carr. Supreme Judicial Court: Chief justice, John A. Peters; associate justices, Andrew P. Wiswill, Lucilius A. Emery, William H. Fogler, W. P. Whitehouse, Thomas H. Haskell, Sewall C. Strout, Albert R. Savage; clerk, W. S. Choate. State legislature consists of 157 Republicans and 25 Democrats. Senators: Eugene Hale, from Ellsworth; William P. Frye, from Lewiston—both Republicans. Representatives: Amos L. Allen, from Portland (*vice* Thomas B. Reed, who resigned August 22, 1899); Charles F. Littlefield (*vice* Nelson Dingley, who died January 13, 1899); E. C. Burleigh, from Augusta; and Charles A. Boutelle, from Bangor—all Republicans.

MALARIAL FEVER AND MOSQUITOES. The most momentous medical discovery of the year 1899 is that of the cause of human malaria. There were several scientists to whom credit is due in the matter, but the lion's share of it belongs to Major Ross, a surgeon in the English army, stationed at Calcutta. During several years of laborious research he forged the links that completed the discovery. As long ago as 1807, Crawford, an American, suggested the possibility of the transmission of malaria to man by the mosquito. Again, in 1848, Nott, of New Orleans, referred to the part played by insects in propagating malarial fever. In 1883 Dr. A. F. A. King, also an American, reiterated the theory at some length, and explained the immunity of the negro by the character of his perspiration. Laveran, who in 1880 discovered the *plasmodium malariae*, the parasite of the disease, declared in 1891 his adherence to the mosquito theory, as did also Flüge in the same year. In 1892 Pfeiffer showed that a variety of protozoa, called coccidia, which are found as parasites in the rabbit, is capable of two cycles of development, one being exogenous. He mentioned that Koch had suggested that a similar condition might hold good for the parasite of malaria, and that exogenous malarial spores might be conveyed to man by the agency of blood-sucking insects. In 1894 Manson, of Great Britain, appeared as a vigorous supporter of the mosquito theory, as best calculated to explain the various conditions of the problem. He drew a parallel between the malarial parasite and the *filaria Bancrofti*, which he had investigated so thoroughly. He suggested that the female mosquito fills herself with infected blood, deposits her eggs and dies beside them. The water in which she lies becomes contaminated with the spores developing in her body, and is then drunk by men, or the spores are inhaled with dust from dried puddles, or the larvæ after being hatched feed on the dead body of the mother, and thus become carriers of infection, or the ground might become infected by the bodies of mosquitoes that contain the parasite dying and falling on it. Ross's really monumental work in his studies of malarial organisms in birds' blood solved the problem. He discovered that, after a special variety of gray mosquito had fed on the blood of birds containing certain mature organisms, called proteosoma, the stomach wall of the insect always contained pigmented coccidia two days later. After other changes had occurred, on the eighth or ninth day, the coccidia rupture, and set free innumerable thread-like bodies, which are distributed, by the blood current of the mosquito, through its tissues. Eventually these bodies are found in certain glands in the thorax

of the mosquito, whose ducts open at such a point as to furnish secretion that lubricates the lancets of the mosquito. When he punctures the skin of his victim, this secretion, containing the thread-like bodies, is injected into the bottom of the wound. Manson and his pupil Daniels proved that these thread-like bodies or germinal spores develop into mature proteosoma in a bird bitten by the infected mosquito, thus completing the cycle.

While Manson was repeating his experiments, Grassi, the distinguished Italian, was completing a series of studies on the mosquitoes of Italy. He found and described three varieties of mosquito, common in malarious regions but unknown in regions free from malaria. In 1898 he determined that *anopheles claviger* was the insect which carried malarial infection. A man who had never before been subjected to malarial infection failed to be infected with certain mosquitoes of the *Culex* variety. After a long period he was exposed to the bites of *anopheles claviger*, and in a short time began to suffer from malarial fever. Quinine cured him of the attack. The Italian scientists Bignami, Bastianelli, and Grassi, working together, arrived at the conclusion that the malarial hemisporidia (small reproductive cells produced within a cyst) run through a cycle in man characterized by a long amœboid stage and an absence of the encapsulated phase, reproducing themselves a great number of times during the completion of this cycle, and also giving rise to forms which remain sterile in man—Grassi's "gameti." These latter forms, taken into the stomach of the *anopheles* with the blood he draws from an infected man develop into sporozoa, and these in turn form sporozoites, delicate filaments which find their way to the salivary glands of the *anopheles*. The saliva, anointing the lancet of the *anopheles*, carries the infection to the next victim bitten.

The family of *Culicida* is composed of the three genera, *Culex*, *Aedes*, and *Anopheles*. Several species of *Culex* do not carry malarial infection, and it has not been charged against *Aedes* that this genus does. Three species of *Anopheles* in Italy have been proved to be malaria carriers: *a. claviger*, *a. bifurcatus*, and *a. pictus*. Five species of *Anopheles* are found in Europe. The division of entomology of the United States Department of Agriculture describes seven species of *Anopheles* in this country, including *a. claviger*, *a. nigripes* (which is supposed to be identical with *a. bifurcatus*), and *a. punctipennis*.

Having ascertained the cause of human malaria, the next problem is to remove it, to destroy the mosquito. During the summer of 1899 Celli and Cassagrandi made several interesting experiments with substances supposedly poisonous to mosquitoes. Several specimens of *Culex*, as well as *Anopheles*, *claviger*, and *a. bifurcatus*, were subjected to the tests, in all stages of development: egg, larva, nymph, and mosquito. In their report they omit consideration of any lethal agent that did not kill larvæ in at least seventy-two hours. They mention as larvicides: 1. Mineral substances: five per cent. solution of permanganate of potassium (which acts slowly), lime, copper sulphate, iron sulphate, and ammonia (all of which act rather slowly), sulphurous water even when not saturated with sulphurous oxide (one of the most active larvicides), corrosive sublimate, even as strong a solution as one per cent. (kills the larvæ slowly and fails to kill the nymphæ). 2. Vegetable substances: strong tobacco, some commercial insect powders obtained from chrysanthemum buds (very potent poisons), other insect powders (weaker), infusion of quassia, of *Solanum nigrum*, and of *Daphne genkwa* (weak). 3. Aniline dyes: gallol of Weiler-ter-Meer, of Verdungen, and green malachite of the Actiengesellschaft für Anilin Fabrikation of Berlin (most energetic action). The gallol is efficacious in a solution of 0.0062 per cent., the malachite in a solution of 0.0125 per cent. Both larvæ and nymphæ are killed by: 1. Oily substances. 2. Sulphurous oxide water, potassium permanganate mixed with hydrochloric acid. 3. Formalin and lysol are not very efficacious, and corrosive sublimate even less so. A rise of temperature in the water shortens the time of destruction of the insects, except in the case of the use of petroleum, which acts mechanically by forming an air-tight pellicle over the water. Petroleum is the first to lose its larvicidal action by evaporation. In the proportion of 0.20 ccm. per 100 cm. of surface it lasted only two days at 18°C. Practically petroleum was found most serviceable, as it is easily used, does not kill fish or the inferior animals and is cheap. The vegetable powders and staining substances are also cheap, and the latter are of great duration. The perfect mosquito is killed by: 1. Odors of turpentine, iodoform, menthol, camphor, and garlic. 2. Fumes of tobacco, chrysanthemum flowers, fresh eucalyptus leaves, quassia wood, pyrethrum, and simple wood smoke. 3. Gases, the most practicable being sulphurous oxide. Winter affords the best chances for destroying mosquitoes, as they take refuge in houses, barns, and cattle sheds during this season. Even at best but little can be accomplished in the way of killing mosquitoes. The best results are to be secured by systematically pouring petroleum upon the surface of ponds, marshes, and puddles where the insect might breed and propagate its species.

MALMESBURY, Fourth Earl of, EDWARD JAMES HARRIS, died May 19, 1899.

Born April 12, 1842, and educated at the Royal Military College at Sandhurst, he entered the army in 1860, becoming in 1865 aide-de-camp to General Lord Strathnairn, commander in Ireland, in 1866 to General Sir John Mitchell, commander in Canada, and in 1868 to Sir Henry Barkly, governor of Mauritius. From 1875 to 1880 he was an adjutant in the Royal Irish Rifles, and later became lieutenant-colonel of this regiment, retiring in 1882. He succeeded to the title upon the death of his uncle, the third earl, in 1889. His heir is his son, the Viscount Fitz-Harris, born in 1872.

MALONE, Rev. SYLVESTER, pastor of the Church of Sts. Peter and Paul, Brooklyn, N. Y., died December 29, 1899, at the age of 78 years. Father Malone was a conspicuous member of the liberal wing of the Roman Catholic Church. While never in the least compromising in his convictions regarding his own church, he recognized freely the good influence and work of other denominations. He was an ardent American, and strenuously endorsed the public school system. It was his constant endeavor to modify the high sectarian feeling between the Protestants and Catholics. While devoted to the institutions and methods of Catholicism, he was on terms of intimate friendship, at the same time, with many prominent Protestant ministers. Besides being an intense American, Father Malone had been an ardent abolitionist, and the Church of Sts. Peter and Paul was the first Catholic church to display the Stars and Stripes upon the outbreak of the Civil War. Father Malone prominently endorsed Father McGlynn during the ecclesiastical fight which resulted in that priest's suspension, and he even addressed a memorial to the Pope, in which he said: "The charges against Dr. McGlynn raise the question of the right of the citizen to express his views freely and openly on all subjects that are non-essential. Nothing can alter this view of the case, and I ask, is it wise to give our fellow-citizens cause, even for suspicion, that Catholics are the enemies of the principle of civil liberty, held so sacred by all Americans?" Father Malone came to the United States from Ireland in 1838. He was educated at the seminary at La Fargeville, N. Y., and at St. John's College, Fordham, and on August 15, 1844, was ordained to the priesthood. Three years later he became rector of the church of Sts. Peter and Paul, which position he retained to the time of his death. He was nominated in 1894, at the suggestion of Hamilton Fish, to a vacancy in the Board of Regents of the University of the State of New York, and, although opposed by the archbishop of New York, was elected.

MALTA, an island colony of Great Britain, situated in the Mediterranean, 58 miles south of Sicily, and about 180 from the African coast, comprises besides the island of Malta, several islets, and Gozo and Comino. The total area is 117 square miles, of which Malta has 95 and Gozo about 20. The total population at the beginning of 1899 was 180,328, besides British troops, numbering 11,317. The capital is Valetta, which has an excellent harbor, and the population of which is about 50,000. Valetta is also one of the great naval stations of Great Britain. The government is administered by a governor, who is assisted by an executive council of 7 official and 3 unofficial members, and a legislative council of 6 official and 14 elected members. The governor and commander of the troops is Lieutenant-General Sir Francis Wallace Grenfell, G.C.B., G.C.M.G.

The lower classes of the inhabitants are chiefly Punic and speak a dialect of Semitic origin; the upper classes are of Italian and other European origin, and usually speak Italian. Roman Catholicism is the prevailing religion, and the schools, including those that receive government aid, are Roman Catholic. The public schools in 1897 numbered 119, with 14,836 pupils; there were 116 private schools with 3679 pupils. In addition there are a university, a lyceum, and 2 secondary schools. The government grant for public schools in 1897 amounted to £21,232. The chief industry is agriculture, and the leading products potatoes, cotton, oranges, honey, figs, and corn; the manufactures include cotton goods, filigree, and matches. The vegetable production is not sufficient to supply the military and naval forces stationed in Malta; in 1898 the potato crop was a failure. Over 4000 women and children, chiefly in Gozo, are employed in making lace. The commerce is chiefly transit. Imports and exports in 1897 amounted to £10,895,639 and £10,088,760 respectively; of the imports only £905,006 were actually disembarked, the rest being in transit. Imports and exports, actual, in 1898, were £880,164 and £51,597 respectively; in transit, £9,144,967 and £9,327,543 respectively. Vessels entered in 1897 numbered 4111, aggregating 3,637,426 tons; cleared, 4079, with a tonnage of 3,607,042. In 1898 the entrances numbered 3890, with a tonnage of 3,563,728.

The chief sources of revenue are custom duties. Revenue and expenditure in 1897 were £323,787 and £324,673 respectively; in 1898, revenue, £332,488; expenditure, £339,082. The public debt in 1897 was £79,168.

There are reported 8 miles of railway, 65 miles of telegraph lines, and 350 miles

of telephone lines. Early in 1899 direct steamship communication was established between New York and Malta.

Up to March, 1899, Italian was the only language of the courts, but in that month English was made allowable. It was announced at that time that after fifteen years all legal proceedings would be conducted in English instead of Italian. The change was made by an order in council, the legislative body being opposed to it. The latter body considered the change degrading to the inhabitants of Malta, but it has been shown that the majority learn English rather than Italian at school, where a choice is offered.

MAMMALOGY. See ZOOLOGICAL LITERATURE.

MANGANESE. The production of manganese in 1898 came from six States, which was one less than the previous year, and amounted to 15,987 long tons, valued at \$129,185, or an increase of nearly 44 per cent. over the output for 1897. This increase was due to the great stimulation that existed in the steel industry for the same year, as the chief market for the manganese ore is in the production of ferro-manganese at steel works. The amount of ore used by chemical works is comparatively small. Virginia, Georgia, and Arkansas continued to be the important producing States, while small quantities came from Alabama, California, and Tennessee. Manganese was also produced from other ores and in the following amounts:

Kind of Ore.	Quantity. Long Tons.	Value.
Manganiferous iron ore.....	287,810	\$424,302
" silver ore.....	99,651	295,412
" zinc ores.....	48,502	26,676
Imported manganese ore.....	114,885	831,967

Much manganese ore is being shipped from Leadville, Col., at the present day, so that the camp is not entirely dependent on its lead silver ores.

MANITOBA, a province of the Dominion of Canada, with an area of 73,956 square miles; capital, Winnipeg.

Agriculture.—In the calendar year 1898 the yield of wheat was 25,313,745 bushels; oats, 17,308,252; barley, 4,277,927; flax, 350,000; potatoes, 3,253,038; rye, 63,860; pease, 31,880; and roots, 2,471,715. The area devoted to these crops aggregated over 2,225,000 acres. Wheat had an increased acreage and a yield exceeding that of the previous year by more than 7,000,000 bushels. In September, 1899, Premier Greenway estimated that the growing crop would double that of 1898. Live stock comprised principally 227,097 cattle, 101,836 horses, 69,648 swine, and 32,053 sheep.

Fisheries.—The value of the yield of the fisheries of Manitoba and the Northwest Territories combined in 1897 was \$638,416; principal catch, whitefish, \$413,893, and herring, \$117,667; value of all apparatus employed in the fisheries, \$237,646; value of exports of fishery products (1898), \$211,748; fry distributed in 1898, 9,000,000.

Mining.—The principal mineral production is coal, which in 1898 yielded 340,088 tons in Manitoba and the Northwest Territories together. In addition to its share in the total output, Manitoba imported 30,964 tons for home consumption, and the Northwest Territories exported 40,434 tons.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise aggregated in value \$4,432,184, practically all of which was entered for home consumption; exports, domestic and foreign, \$3,472,801, an increase in a year of \$1,507,046; duty collected, \$907,050. The registered merchant marine, January 1, 1899, comprised 80 steamers of 6692 gross tonnage, and 41 sailing vessels of 747 tonnage.

Banks.—On January 1, 1899, there were 46 chartered bank branches in the province, and during the previous year the exchanges at the clearing house in Winnipeg amounted to \$90,754,276, an increase in a year of \$6,318,444. There were 29 post-office savings banks, with 1730 depositors and \$304,133 deposits, and 1 government savings bank, with 3880 depositors and \$888,777 deposits.

Railways and Post-Offices.—In 1898 the total length of railways was 1621 miles. Manitoba and the Northwest Territories together had 796 post-offices, in which were posted in a year 10,350,000 letters and 1,250,000 postal-cards, and Manitoba alone had 90 money-order offices, which issued 70,015 orders.

Education.—The school population in 1897 was 51,178, and the enrolment in the 1068 public schools was 39,841, and the average attendance 21,500. Collegiate institutes for advanced education are attached to the public schools in Winnipeg, Portage la Prairie, and Brandon, and have an aggregate enrolment of 818 students. There is also a normal school in Winnipeg for the training of teachers. At the end of 1899 there were 52 periodicals, of which 6 were dailies and 37 weeklies.

Finances.—The revenue of the province in the year ending December 31, 1898, was \$936,604; expenditure, \$837,888; gross debt, \$5,701,951; Dominion government debt allowance, \$3,707,196; other assets, excluding public buildings and grounds, \$4,962,276; total assets, \$8,669,472; excess of assets over gross debt, \$2,967,521.

Population.—Local estimates in 1898 gave Winnipeg 39,384, and Brandon 5928. The Indian population of the province and the reservation in the Northwest Territories was 21,316. In the province alone were 54 schools for Indian youth, with enrolment 1932, and average attendance 984. The Indians cultivated 1215 acres of land, had 2961 head of live stock, and received \$54,971 from their fish, furs, and other industries.

MANUFACTURES. The reviews of special industries given elsewhere in this volume (see CALCIUM CARBIDE; CARBORUNDUM; CARS; CEMENT; COKE; COTTON, IRON AND STEEL; LOCOMOTIVES; SHIP-BUILDING; SILK AND WOOL) all show a notable increase in production in 1899 as compared with previous years. They are, however, only notable examples of the progress which has been witnessed during the year in all branches of manufactures in the United States. While similarly complete figures are not available for foreign countries, it can be stated that nearly all the industrial European nations have experienced a year of exceptional activity in the production, consumption, and trade in manufactured articles. As a single example of this progress, but, nevertheless, a very important one, the exports of iron and metals and manufactures thereof from Great Britain during 1898 and 1899 may be given. The figures are as follows:

	Quantities. Gross tons.		Values. Pounds sterling.	
	1898.	1899.	1898.	1899.
Brass, manufactures of.....	5,394	5,706	471,234	563,167
Copper, ingots, etc.....	26,662	31,938	1,430,153	2,326,800
Copper, manufactures of.....	13,579	11,054	861,563	912,518
Yellow metal.....	10,222	6,927	505,024	437,388
Hardware.....			1,430,356	1,536,910
Cutlery.....			556,334	608,336
Implements and tools.....			1,814,676	1,429,700
Pig-iron.....	1,042,853	1,379,296	2,789,098	4,784,357
Bar, angle and rod.....	150,119	159,133	903,973	1,227,336
Rails.....	476,047	472,672	2,173,665	2,313,961
Chairs and sleepers.....	73,048	61,080	311,307	312,469
Unenumerated railroad material.....	60,308	58,065	536,773	504,122
Wire, and manufactures.....	44,123	49,253	772,604	893,301
Hoops, sheets and plates.....	101,222	110,013	779,181	922,380
Galvanized sheets.....	226,406	226,353	2,533,376	3,121,410
Tin plates.....	250,953	256,629	2,744,077	3,167,683
Cast, wrought and all others not enumerated.....	355,662	358,125	4,734,459	5,232,098
Old iron and steel for remanufacture.....	84,802	116,400	228,561	320,524
Steel, unwrought.....	225,249	328,580	2,640,186	3,308,462
Black plates for tinning.....	58,337	85,567	541,866	827,365
Manufactures of steel or steel and iron combined.....	35,071	44,470	904,231	1,021,359
Lead and manufactures.....	38,075	40,381	545,354	635,630
Plate and plated ware.....			427,443	423,238
Telegraph wire and apparatus.....			985,253	1,407,733
Tin, unwrought.....	5,467	4,709	391,896	587,531
Spelter, and manufactures.....	8,665	6,707	187,512	154,389
Other metal articles.....			1,086,987	1,129,220
Locomotive engines.....			1,483,800	1,468,467
Agricultural engines.....			687,234	764,471
Other steam engines.....			1,454,928	1,642,675
Agricultural machinery.....			850,226	944,430
Sewing machines.....			1,083,481	1,292,033
Mining machinery.....			716,377	735,092
Textile machinery.....			6,628,012	6,819,598
Other machinery.....			5,485,405	5,984,064

The records of foreign commerce of the United States for 1898 and 1899 furnish some very interesting figures respecting the growth of manufactures in the United States. During 1899 the total foreign trade of the United States amounted to \$799,834,620 in imports and \$1,275,486,641 in exports. Of the exports, more than 30 per cent. were manufactures, and of the imports, 33 per cent. were raw materials for the use of manufacturers. In both instances these figures are larger than ever before. The following figures show the values of the principal manufactures and manufacturers' materials imported into the United States in 1896, 1898, and 1899, as they are given by the Bureau of Statistics of the United States Treasury Department.

Montfort-l'Amaury, and became an enthusiastic Boulangist politician, and presented himself as a candidate for the elections of 1893 in the *arrondissement* of Rambouillet, which he succeeded in obtaining. See FRANCE (paragraphs on History).

MARCHAND, Major JEAN, the French officer who in 1898 led an expedition to Fashoda, returned to France in the spring of 1899, was made a commander of the Legion of Honor, and was awarded by the Academy of Moral and Political Sciences the Audiffret prize of 15,000 francs, given annually for the greatest act of devotion. He was born November 22, 1863, at Thoissey, in the department of Aisne. After a short experience as clerk to a notary he entered the army in 1883, and until 1887 attended the military school of St. Maixent. In 1889 he went to West Africa and took part in the expedition of Marine-Lieutenant Hourst in the exploration of the Niger, and the next year he participated in the expedition that led to the capture of Segou, and in 1891 was French resident to King Tiba at Sikaso. In 1892, after being promoted to the rank of captain, he returned to France, but in March, 1893, went again to Africa and proceeded from the Ivory Coast to Tengrela in the Niger Territory; after his return to the coast he took part under Monteil in the battle against King Samory. Going back to France at the end of 1895, he conceived the plan of sending an expedition across the continent from the coast of French Congo to the Upper Nile. Receiving the command himself, he returned to Africa, and with 169 followers left Brazzaville on the 21st of March, 1897, taking two gunboats up the Congo and the Ubangi. After reaching Ratai he experienced great difficulty in transporting his boats over the Nile-Congo watershed. Near the confluence of the Such and the Uau, Marchand established Fort Desaix, at More he set up an arsenal, and by the end of 1897 he had in the valley of Bahr-el-Ghazal 7 steel boats, a steamer, and 15 lighters. After successful fights with the Dervishes he reached Fashoda on July 10, 1898, with 8 officers and 120 men. Bonchamp's relief expedition from Abyssinia was forced to return on account of the swampy region about the Sobat. The occupation of Fashoda precipitated an international dispute, when on September 21, 1898, General Kitchener, commander of the Anglo-Egyptian army, arrived there and demanded the evacuation of the place. While the settlement of the question of possession was pending, Marchand decided to return to France, and reached Cairo on the 3d of November. Two days later it was announced that France had withdrawn her claims. Marchand, who had now been promoted to major, returned to Fashoda. On the 11th of December he left there with his men, going up the Nile in a gunboat to the mouth of the Sobat, and then up that river; when navigation was no longer possible the company proceeded on foot, and came to Adis Adaba, Abyssinia, on March 11, 1899. About the middle of May, after traversing a most hazardous route, he reached Djibouti, and by the end of the month arrived in Paris. Though politically a failure, Marchand's expedition, bringing to light a hitherto unknown region of Africa, was a success from the geographical point of view.

MARCONI, WILLIAM, electrical engineer and inventor of what is thus far the most successful system of wireless telegraphy, was born in 1875 at Marzabotto, near Bologna, Italy. His mother was an English woman. Signor Marconi was educated at Leghorn under Professor Rosa and at the University of Bologna under Professor A. Righi. During this time he developed to some extent his system of wireless telegraphy, beginning his experiments without wires in 1895 on his father's estate at Bologna; here he succeeded in transmitting messages over distances exceeding a mile. After reading the works of Professor William Henry Preece, F.R.S., he went to him for advice. Marconi's apparatus was tested, and he and Mr. Preece in 1896 conducted experiments between Penarth and Weston, England, with favorable results. Further experiments were then made in Rome and Spezia, and messages were sent from the shore to a steamer about nine and one-third miles distant. In the latter part of 1897 Signor Marconi began experiments at the Needles on the Isle of Wight, and about the 1st of the following January succeeded in signalling to the mainland. He then established a station at Bournemouth, fourteen miles from the Needles, but later moved it to Poole, four miles farther. Since that time the sending of messages without wires from the Needles to Poole has been a common occurrence. For a further discussion of this subject see the article WIRELESS TELEGRAPHY.

MARCY, OLIVER, A.M., LL.D., professor of geology and dean at Northwestern University, died March 19, 1899. He was born at Colerain, Mass., February 13, 1820; was graduated in 1846 at Wesleyan University, Middletown, Conn. From this year until 1862 he taught in Wilbraham Academy, when he was called to the chair of geology in Northwestern University at Evanston, Ill., which position he retained to the time of his death. From 1876 to 1881 he was acting president of the university. Professor Marcy was a member of the Chicago Academy of Sciences, an associate member of the National Geographical Society and of the American

Ornithological Union, and a fellow of the American Association for the Advancement of Science and of the Geological Society of America.

MARINE BIOLOGICAL ASSOCIATION. See ZOOLOGICAL STATIONS; FISH AND FISHERIES.

MARINE ENGINEERING during the past sixty years was ably discussed at the last (Dover) meeting of the British Association for the Advancement of Science by Sir William Henry White, director of naval construction of the British navy. In fifty to sixty years the speed of transatlantic vessels has increased from $8\frac{1}{2}$ to $22\frac{1}{2}$ knots; ships have trebled in length, about doubled in width, and increased tenfold in displacement. The engine power is now about forty times as great, and the coal consumption per horse-power hour only one-third what it was in 1840. Modern twin-screw engines at high pressure now produce 6 to 7 horse-power per ton weight of propelling machinery, including boilers, against 2 horse-power in 1840, in both cases at sea. Looking ahead another sixty years, Sir William said it would be idle to predict the characteristics of ocean navigation at that time, but some of the probable lines of advance mentioned were: Reductions in the weight of propelling apparatus, of fuel, and of hulls. The use of water-tube boilers in war-ships has saved one-third of the weight of the old cylindrical boilers, with the same power and natural draft, but no great saving in coal consumption is expected from the water-tube boiler. Liquid fuel, he thought, would have advantages over coal, especially in transportation to the ship, and in feeding the fires. Even if liquid fuel saved only one-third the weight of coal required to do the same work, it would reduce the fuel load of an Atlantic liner by 1000 tons (of 2240 pounds), which could be utilized in increased cargo or speed. Adequate supplies of liquid fuel, however, do not appear to be available. In the matter of weight of the vessel itself, he estimated that in an Atlantic liner of 20 knots about 1000 tons' weight could be saved by substituting nickel steel for the mild steel that has so recently replaced wrought iron. Although this would increase first cost, the reduction in weight would enable the speed to be increased by 1 knot, or from 20 to 21 knots, without changing dimensions. In conclusion, Sir William thought that vessels still larger than any yet built might be expected.

Water-tube boilers have been adopted by the United States Navy for our future war-ships. The reasons for this course were given at length by Rear-Admiral George W. Melville, engineer-in-chief, U. S. N., in a paper read before the New York meeting of the Society of Architects and Marine Engineers, November 16-17, 1899. Admiral Melville stated that he had opposed their adoption until "convinced that they must be used if we are not going to content ourselves with inferior ships to those built for other nations." The advantages and disadvantages of water-tube boilers, as compared with cylindrical boilers, were concisely summarized by Admiral Melville as follows:

"Advantages: Less weight of water, quicker steamers, quicker response to change in amount of steam required, greater freedom of expansion, higher cruising speed, more perfect circulation, adaptability to high pressures, smaller steam pipes and fittings, greater ease of repair, greater ease of installation, greater elasticity of design, less danger of explosion.

"Disadvantages: Greater danger from failure of tubes, better feed arrangements necessary, greater skill required in management, units too small, greater grate surface and heating surface required, less reserve in form of water in boiler, large number of parts, tubes difficult of access, large number of joints, more danger of priming."

The two new United States battle-ships, the *Kearsarge* and *Kentucky*, are being equipped with electric power for hoisting coal, boats, and ammunition, training guns, and driving ventilating apparatus.

A number of important phases of ship-building, including various engineering points, were covered in a series of papers read before the ship-building section of the biennial conference of the Institution of Civil Engineers, held in London, June 7-9, 1899. These papers, like the others at the conference, were concise reviews of the progress and prospects of the subjects treated, designed largely to draw out discussion.

MARKHAM, EDWIN, poet and educator, was born in Oregon City, Ore., in 1852; his boyhood was passed on a cattle range in central California; he was educated at the State Normal School, and afterward pursued a college course and studied law, but never became a practitioner. He engaged in blacksmithing for a time, and then entered upon educational work; as superintendent and head-master of schools, he has left his impress on California. In 1899 Mr. Markham was principal of the Observation School of the University of California, at Oakland. He is a man of wide reading, possessing one of the largest and best-selected libraries in the State, and was made famous by his short poem, *The Man with the Hoe*, written after see-

ing Millet's well-known painting, and first published in the *San Francisco Examiner* for January 8, 1899.

MARRIAGE, MEDICAL CONTROL OF. In February, 1899, the Senate of the State of North Dakota passed a bill providing for the creation of a commission of three physicians in each county, whose duty it shall be to examine all persons applying for marriage licenses, and to decide if they shall be allowed to marry. Of the soundness of such a measure from a sanitary point of view there can be no doubt; but it remains to be ascertained whether or not sentiment will render it impracticable. Properly used, the power of such a commission would prevent a large number of intended marriages, controlling the propagation of disease and the procreation of defective or degenerate offspring. A certain check could be put in this way to the spread of tuberculosis, hereditary insanity, chronic alcoholism, and those widespread scourges, gonorrhœa and syphilis. Dr. Schulz, the health commissioner of the State of Wisconsin, advocates in his report, issued in October, 1899, making the issuance of marriage licenses subject to medical control. The storm of unfavorable comment raised by Dr. Schulz's suggestion is likely to defeat his purpose for the present.

Fraenkel, of Munich, proposed in an article, published in August, 1899, that the matter of the marriage of sufferers from lung trouble should be regulated. He states that marriage of a formerly tuberculous person may be permitted if the disease has been arrested for several months. If the predisposition to lung disease was hereditary, marriage is not warranted, even after an apparent cure of tuberculosis. Tuberculous men, he finds, bear marriage well; and if their wives be healthy, their children are likely to be healthy also. Tuberculous women, on the other hand, are endangered by pregnancy, labor, and the puerperal state. They give birth, usually, to weak children, whatever the health of the fathers. If marriage of former tuberculous people is permitted, Fraenkel urges that special attention be given to the offspring in the way of a sound wet-nurse, an abundance of milk during childhood, no alcohol, a large quantity of fat and butter, exercise, and sea-bathing.

MARRYAT, FLORENCE (Mrs. Francis Lean), English author, died in London, October 27, 1899. She was a daughter of the late Captain Frederick Marryat, and was born at Brighton, July 9, 1837. She was educated at home, and at a very early age gave evidence of literary taste and ability. It is said that in her twelfth year she wrote a novel which she illustrated with her own pen drawings. As a writer she first gained the attention of the public in 1865, in which year appeared her *Love's Conflict*, *Woman against Woman*, and *Too Good for Him*. There followed a long succession of works, chiefly fiction, many of which were first published serially. In 1872 she became editor of *London Society*. Miss Marryat was also known as a lecturer, an operatic singer, and a comédienne. In collaboration with Sir C. L. Young she wrote *Miss Chester*, a three-act drama, and in 1881 she acted the principal comedy rôle in her own play, *Her World*. Augustin Daly's famous play, *Pique*, was founded upon Miss Marryat's novel, *Her Lord and Master*. Among her works, which number over seventy, are: *My Own Child*; *My Sister the Actress*; "Gup," *Sketches of Anglo-Indian Life and Character*; *Veronique*; *The Confessions of Gerald Estcourt*; *The Prey of The Gods*; *Petronel*; *The Girls of Feversham*; *Nelly Brooke*; *No Intentions*; *Sybil's Friend and How She Found Him*; *Mad Dumaresq*; *Open, Sesame!*; *Her Word Against a Lie*; *Facing the Footlights*; *The Life and Letters of Captain Marryat*. In her later years she had an interest in spiritualism, and among her writings dealing with this subject are *The Risen Dead* and *There Is No Death*. Many of her stories have been translated into German, French, Flemish, Russian, and Swedish. Miss Marryat was twice married, first to Colonel Ross Church, of the Madras Staff Corps, and second to Colonel Francis Lean, of the Royal Marine Light Infantry.

MARSH, OTHNIEL CHARLES, PH.D., LL.D., professor of paleontology in Yale University, and one of the most prominent of modern scientists, died in New Haven, March 18, 1899. He was born in Lockport, N. Y., October 29, 1831, and it was not until 1852 that he entered Phillips Academy at Andover; four years later he entered Yale, and was graduated in 1860. He then continued his studies at the Sheffield School in New Haven, and at the universities of Heidelberg, Breslau, and Berlin. Having returned to America, he was appointed in 1866 to the chair of paleontology at Yale, which position he retained to the time of his death. Professor Marsh was the nephew and heir of George Peabody, and thus was enabled financially to prosecute his scientific researches. It was largely through his suggestion and influence that his uncle founded the Peabody Museum at Yale. In the early part of 1898 Professor Marsh gave to the museum all his scientific collections, which in the course of his many years of study and investigation had become very large and valuable. In many respects the collection of this museum is one of the largest and richest in the world.

From 1868 almost to the time of his death he was actively engaged in paleontological research, especially in the Rocky Mountain region of the United States, though during the last decade he turned his attention to the geology of the region between the Appalachian system and the Atlantic. He crossed the Rocky Mountains twenty-seven times. His work, which was chiefly directed to the discovery of extinct vertebrate animals, was conducted with unusual vigor, and its results showed in him both a keen originality and an "exceptionally clear recognition of the principles of biology." Many of his discoveries are of the first magnitude, while the total "researches conducted by him in person or carried out under his direction have enriched the world's knowledge of paleontology, geology, and kindred sciences more than those of any man living." Charles Darwin wrote in 1882 "that Professor Marsh's printed descriptions of his discoveries afforded the best support to the theory of evolution that had appeared in twenty years." In his various expeditions Professor Marsh discovered hundreds of species of extinct vertebrates, many of which had previously been entirely unknown, while many others had not been found before in America. Among the extinct vertebrates discovered by him are the *odontornithes*, cretaceous birds having teeth; the *dinocerata*, six-horned animals of the eocene period and elephantine in bulk; the earliest ancestors of the horses, *eohippus*, *orohippus* and *ephippus*; the first known American *pterodactyls*, or flying lizards; the *frontotherida*, a new family of ungulates from the miocene period; the first mammals of the jurassic period found in America, together with new families of dinosaurs and some enormous reptiles; and a large variety of American monkeys, bats, and marsupials. The investigation of Professor Marsh that has probably gained the widest popular attention was his tracing of the phylogeny of the horse; in the more restricted circle of scientists his principle of cephalization is regarded as very important. Besides his unflagging industry in discovery the scientific world owes much to Professor Marsh's method of classification and the clear setting forth of the results of his work. He published many scientific articles. Almost his entire fortune was left to Yale University. He was an honorary member of several European academies of science; he received the Bigsby medal of the Geological Society of London (1877), of which he was a fellow; he received the Cuvier prize of the Institute of France; he was a fellow of the Royal Geographical Society; he was president of the American Association for the Advancement of Science in 1878, and of the National Academy of Sciences from 1883 to 1885. Few men have reached a higher place in the realm of science than he; his "whole life illustrates the possible achievement to be derived from absorbed and single application of natural powers in one chosen direction."

MARSHALL, Mrs. EMMA (born MARTIN), English author, died May 6, 1899. She was born near Cromer, England; was educated at a private school at Norwich; thereafter she lived chiefly at Wells, Exeter, Gloucester, and Bristol. She wrote a large number of historical novels, each usually having some well-known personage as its central character. Among such of her characters are Sir Philip Sidney, George Herbert, Sir Thomas Brown. The time of her *In the Choir of Westminster Abbey* (1897) is that of Henry Purcell; *Under the Dome of St. Paul's* (1898) treats of the time of Sir Christopher Wren. Among her most popular works are *Penshurst Castle*; *Winchester Meads*; *Under Salisbury Spire*. Besides *Under the Dome of St. Paul's* she published in 1898 *Better Late than Never*. Many of her books have been translated into German, appearing especially in the Tauchnitz edition.

MARSHALL, GEORGE A., ex-congressman from Ohio, died April 22, 1899. He was born in Shelby County, O., September 14, 1851; was educated at the public schools, and at the Ohio Wesleyan University. He studied law, was admitted to the bar, and, being elected prosecuting attorney of Shelby County, served in that capacity for eight years. He was elected as a Democrat to the Fifty-fifth Congress by 9000 plurality, to represent the fourth district of Ohio. His term expired March 4, 1899.

MARTINIQUE, one of the Lesser Antilles lying between the Windward and Leeward groups, is a French dependency having an area of 381 square miles, and a population (1895) of 187,692. The colony is represented at Paris by a senator and two deputies; it is administered by a governor with a general council and municipal councils. The seat of government is at Fort de France, or Fort Royal; St. Pierre, with a population of about 25,400, is the largest and chief commercial town. There are 13 denominational and private schools, one normal school, a law school at Fort Royal, 3 secondary schools with about 490 students, and 38 primary schools with about 10,300 pupils. Local revenue and expenditure for 1898 balanced at 2,581,848 francs; the expenditure of France in the budget of 1899 was 2,581,848 francs; there is an annuity debt of 95,000 francs. The principal products are sugar, coffee, cacao, cotton, and tobacco. The export of sugar in 1896 was 34,429 tons, and of rum and arrack 3,765,000 gallons. In 1897 the exports to France amounted to 18,997,565 francs and the imports from France 12,965,952.

MARTUCCI, GIUSEPPE, Italian composer, born in Capua in 1856, was educated at the Naples Conservatory, and has acquired a reputation as a pianist on the Continent and in England. He is now director of the Bologna Conservatory, and is regarded as one of the best Italian composers of the day. His symphony in D minor (*op.* 75), first performed by the Società del Quartetto, Milan, 1895, was played by the London Philharmonic, May 4, 1899.

MARYLAND, a Middle Atlantic State, has an area of 12,210 square miles. The capital is Annapolis.

Mineralogy.—Coal-mining is carried on in two counties only, Allegany and Garrett, and is the most productive in the first. The system continues to be pick-mining. During the calendar year 1898 the output of 31 mines was 4,674,884 short tons, valued at the mines at \$3,532,257, an increase in a year of 232,756 tons, and the largest on record in the State. Of the total output, 4,618,990 tons was shipped at the mines for commercial sales. There was an increase in a year of \$353,798 in the aggregate value of quarry products, the several outputs being: Granite, \$317,258; sandstone, \$13,646; slate, \$82,240; marble, \$120,525; and limestone, \$433,653—total value, \$967,322. The production of iron ore was 5941 long tons, valued at \$11,882.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 18,562,432 bushels, value, \$6,682,476; wheat, 10,710,966, \$7,283,457; oats, 1,675,596, \$502,679; rye, 353,276, \$201,367; buckwheat, 97,630, \$54,673; potatoes, 1,420,352, \$724,380; and hay, 319,781 tons, \$3,885,339. Live stock, January 1, 1900, comprised horses, 130,959, \$6,950,014; mules, 12,891, \$937,005; milch cows, 154,712, \$4,610,418; other cattle, 102,723, \$2,604,643; and sheep, 138,177, \$485,553.

Manufactures.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$6,926,472. There were 43 manufacturers of tobacco and 783 of cigars, and the total output was 284,361,775 cigars, 487,665 cigarettes, 206,373 pounds of fine-cut tobacco, 12,115,724 pounds of smoking, and 909,869 pounds of snuff. Grain and fruit distilleries in operation numbered 29; the production of fruit brandy was 12,409 gallons; amount of distilled spirits gauged, 14,569,232 gallons; and production of fermented liquors, 976,293 barrels. The production of pig-iron was 190,974 long tons, and of all kinds of rolled iron and steel, 149,820 long tons. More than half of the limestone output was burned into lime, and the bulk of the remainder was used for paving, road-making, and building purposes. Almost all the granite and marble was cut for building uses, and the bulk of the slate for roofing.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the port of Baltimore aggregated in value \$9,151,155, an increase in a year of \$244,037, and the exports, \$107,156,240, a decrease of \$11,689,340. The only trade in gold and silver was exports of \$6810, making the total foreign trade of the year \$116,314,205, a net decline of \$11,486,949.

Banks.—On October 31, 1899, there were 69 national banks in operation and 4 in liquidation. The active capital aggregated \$15,694,960; circulation, \$5,792,577; deposits, \$56,305,173; and reserve, \$14,996,571. The State banks, June 30, 1899, numbered 22, and had capital, \$1,704,250; deposits, \$6,431,230; and resources, \$9,143,960; loan and trust companies, 3, with capital, \$1,850,000; deposits, \$3,761,530; and resources, \$7,595,544; private banks, 5, with capital, \$138,300; deposits, \$362,129; and resources, \$530,151; and mutual savings banks, 18, with depositors, 166,337; deposits, \$55,564,940; and resources, \$58,166,330. The exchanges at the United States clearing house at Baltimore in the year ending September 30, 1899, aggregated \$1,276,120,171, an increase of \$387,953,740 in a year.

Railways.—The new railway construction during 1898 was 15.80 miles, and during 1899, 32.50 miles, giving the State a total mileage of 1,357.54.

Education.—At the close of the school year 1897-98, the school population was 351,400; enrolment in the public schools, 236,003; and average daily attendance, 134,539. There were 4987 teachers, 2465 buildings used as school-houses, and public school property valued at \$4,500,000. The revenue was \$2,991,271; expenditure, \$2,709,104, of which \$2,027,615 was for teachers' salaries. There were 46 public high schools, with 143 secondary teachers, 3922 secondary students, and 1294 elementary pupils; 39 private secondary schools, with 197 secondary teachers, 1896 secondary students, and 1697 elementary pupils; 2 public normal schools, with 16 teachers and 481 students in all departments; and 2 private ones, with 11 teachers and 98 students. Normal training was also given in 2 colleges and 1 public high school. Eleven colleges for men and for both sexes reported 24 fellowships, 259 scholarships, 270 professors and instructors, 1990 students, 185,310 volumes in the libraries, valued at \$239,840; \$182,377 invested in scientific apparatus, \$2,017,626 in grounds and buildings, and \$3,407,500 in productive funds; \$393,299 in total income, and \$72,958 in benefactions. Five colleges for women reported 1 fellowship, 21 scholarships, 87 professors and instructors, 744 students, 19,500 volumes in the libraries, \$54,550 invested

in scientific apparatus, \$1,270,000 in grounds and buildings, and \$363,500 in productive funds, \$102,046 in total income, and \$13,000 in benefactions. In 1899 there were 204 periodicals, of which 17 were dailies, 142 weeklies, 33 monthlies, and 6 quarterlies.

Finances.—The treasury receipts in the year ending September 30, 1898, were \$3,095,314; expenditures, \$3,236,101; cash balance, \$566,351; total funded debt, \$9,284,986; sinking funds, \$6,251,958; net debt, \$3,033,028, offset by unproductive stocks, \$8,649,627, and amount due from accounting officers and incorporated institutions, \$615,375. The tax rate was \$1.77½ per \$1000, and the total assessed valuation, \$603,326,096. On January 1, 1899, the net debt was \$3,564,513.

Population.—As estimated by federal officials the population on June 30, 1899, was about 1,275,000.

Party Platforms.—The Democratic State convention was held in Baltimore, August 2, 1899. The platform insisted that in time of war as well as of peace the freedom of the press should be preserved, and that the right of the people to criticise freely the policy and conduct of the administration should be defended at all hazards; declared unalterable opposition to the creation and maintenance of a large standing army in time of peace; declared Republican legislation responsible for the "gigantic industrial and commercial trusts," and demanded a non-partisan administration of the police department and the public schools. It will be seen that no reference was made to the Chicago platform, nor to the free silver issue, but it was said that all the nominees favored the gold standard. The Republican party was declared responsible for the numerous violations of the law on the part of the negroes, the latter believing that they will receive protection and immunity from punishment on account of their votes, which, it is asserted, are cast almost solidly for the Republican ticket.

The Republican State convention was held September 6, 1899, and its platform declared belief in the gold standard and that all our currency should be made at law redeemable in gold coin at the option of the holder; favored import duties for protection and revenue; expressed confidence in the national administration's ability to solve the Philippine problem; favored laws to suppress trusts and all combinations which create monopoly, but opposed legislation merely for popular effect, in reckless disregard of business revival after prolonged depression; declared that the finances of the State were in a better condition than ever before; favored a non-partisan administration of the schools; pledged a non-partisan reorganization of the Baltimore Police Department, and legislation further to guard the fairness and purity of elections.

Elections.—Governor Lloyd Lowndes, the Republican candidate, received 116,286 votes; Mr. John Walter Smith, the Democratic candidate, 128,409 votes, and was therefore elected by a plurality of 12,123; the total vote cast was 244,695. In the campaign several questions of a local and personal character had so great prominence that national issues were completely overshadowed. The result was regarded by the friends of ex-Senator Gorman as restoring the latter's political prestige.

State Officers and National Representatives.—Governor, John Walter Smith; secretary of state, Richard Dallam; comptroller, J. W. Hering; treasurer, T. J. Shryock; adjutant-general, L. A. Urhner; attorney-general, Isidor Rayner; superintendent of education, E. B. Prettyman; commissioner of insurance, T. Albert Kurtz. Court of Appeals: Chief judge, James McSherry; associate judges, David Fowler, A. Hunter Boyd, Henry Page, I. Thomas Jones, John P. Briscoe, S. D. Schmucker, James A. Pearce; clerk, Allen Rutherford. The State legislature consists of 37 Republicans and 80 Democrats. Senators: Louis E. McComas, from Baltimore; George L. Wellington, from Cumberland—both Republicans. Representatives: William B. Baker (Rep.), from Aberdeen; Frank C. Wachter (Rep.), from Baltimore; James W. Denny (Dem.), from Baltimore; Sydney E. Mudd (Rep.), from La Plata; and George A. Pearre (Rep.), from Cumberland. One seat in the House of Representatives is vacant owing to the election of John Walter Smith for governor, November 7, 1899.

MASON, THEODORUS B. M., lieutenant-commander, U. S. N., retired, who died October 15, 1899, at the age of 51 years, was instrumental in developing the Bureau of Naval Intelligence during the war with Spain. He was a native of New York State, but was appointed to the Naval Academy from Florida. He became a midshipman in 1864, an ensign in 1869, a master in 1870, a lieutenant in 1872, and a lieutenant-commander on January 23, 1894. On December 8, 1894, he was retired, but was called into service again during the Spanish war.

MASSACHUSETTS, a New England State of the United States, has an area of 8315 square miles. The capital is Boston.

Mineralogy.—The production of granite in the calendar year 1898 fell slightly below that of the previous year, and was in greater demand for building purposes than for monumental work. The quarry outputs were: Granite, \$1,650,508; sandstone, \$91,287; slate, \$958; marble, \$38,210; and limestone, \$174,822—total, \$1,955,785.

Massachusetts and Connecticut together had a yield of 20,251 long tons of brown hematite ore, valued at \$53,628.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 1,449,504 bushels, value, \$739,247; oats, 489,027, \$185,830; barley, 50,850, \$34,578; rye, 133,296, \$105,304; buckwheat, 44,180, \$30,923; potatoes, 3,760,710, \$2,143,605; and hay, 667,499 tons, \$10,346,234. Live stock, January 1, 1900, comprised horses 66,017, \$5,154,136; milch cows, 181,589, \$6,755,111; other cattle, 73,378, \$1,990,270; and sheep, 40,194, \$182,883.

Manufactures.—During 1898 the production of pig-iron was 3661 long tons, and of all kinds of rolled iron and steel, 104,221 long tons, an increase in the latter in a year of nearly 10,000 tons. A noteworthy industrial feature of 1899 was the completion of the Otto-Hoffman by-product coke plant at Everett. It has 400 ovens, and the largest gas holder and purifying house in the world, receives its coal from Nova Scotia, and produces gas for illuminating and fuel purposes, coal tar for street paving, and coke for its usual uses. During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$8,153,620. There were 31 manufacturers of tobacco and 722 of cigars, and the combined output was 103,811,603 cigars, 3,244,480 cigarettes, 233 pounds of fine-cut tobacco, 15,114 pounds of smoking, and 78,860 pounds of snuff. Distilleries in operation numbered 11; amount of spirits rectified, 3,816,587 gallons; distilled spirits gauged, 10,139,489 gallons; fermented liquors produced, 1,763,939 barrels. The annual report of the Bureau of Statistics of Labor for 1898 shows: Establishments considered, 4701; value of goods made and work done in the nine leading industries, \$865,619,185; capital invested in manufacture of boots and shoes, \$22,414,665, cotton goods, \$112,702,330, woollen goods, \$26,930,024, and machines and machinery, \$32,686,813; annual wages paid for boots and shoes, \$23,904,714, cotton goods, \$26,294,240, woollen goods, \$7,205,613, and machinery, \$10,068,181; and persons employed on boots and shoes, 51,897, cotton goods, 81,385, woollen goods, 19,438, and machinery, 18,658. Textile goods show a largely decreased production, but the general manufacturing output was substantially increased.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at ten ports of entry and delivery aggregated in value \$52,228,433; exports, \$128,047,814, an increase in a year in imports of \$608,359, and in exports, \$10,512,452. The trade in gold and silver was, imports, \$114,135; exports, \$22,409, making the total foreign trade of the year \$180,612,791, a net increase of \$10,795,515.

Banks.—On October 31, 1899, there were 250 national banks in operation and 41 in liquidation. The active capital aggregated \$80,827,500; circulation, \$29,754,578; deposits, \$305,283,019; and reserve, \$82,744,345. The loan and trust companies, June 30, 1899, numbered 34, and had capital, \$11,375,000; deposits, \$117,945,813; and resources, \$138,423,252; and the mutual savings banks, 186, with depositors, 1,465,960; deposits, \$599,215,854; and resources, \$542,985,597. The exchanges at the United States clearing houses at Boston, Springfield, Worcester, Lowell, New Bedford, and Fall River in the year ending September 30, 1899, aggregated \$7,058,260,809, a net increase of \$1,548,543,941 in a year.

Railways.—There was no new railway construction during 1898, and only 4.20 miles in 1899, giving the State a total mileage of 2111.79. A great sensation in railway circles was occasioned in the summer of 1899 by the leasing of the Boston and Albany system to the New York Central and Hudson River Railroad for a term of 999 years, on the basis of a guarantee of 8 per cent. on the Boston and Albany stock.

Education.—At the end of the school year 1897-98 the school population was 616,100; enrolment in the public schools, 456,141; and average daily attendance, 349,147. There were 13,203 teachers, 3395 buildings used for school-houses, and public school property valued at \$39,077,405. The revenue was \$13,653,649; expenditure, \$13,653,649, of which \$7,733,138 was for teachers' salaries. There were 227 public high schools, with 1356 secondary teachers, 33,322 secondary students, and 842 elementary pupils; 96 private secondary schools, with 648 secondary teachers, 5574 secondary students, and 1889 elementary pupils; 10 public normal schools, with 168 teachers and 4051 students in all departments; and 3 private ones, with 17 teachers and 168 students. Normal training was also given in 3 colleges and 11 public high schools. Nine colleges for men and for both sexes reported 51 fellowships, 862 scholarships, 753 professors and instructors, 7527 students, 719,959 volumes in the libraries, valued at \$686,000; \$1,313,450 invested in scientific apparatus, \$8,142,425 in grounds and buildings, and \$15,421,277 in productive funds, \$1,712,316 in total income, and \$1,559,355 in benefactions. Five colleges for women reported 135 scholarships, 308 professors and instructors, 2621 students, 38,183 volumes in the libraries, valued at \$125,800; \$136,500 invested in scientific apparatus, \$2,547,533 in grounds and buildings, and \$1,329,389 in productive funds, \$655,144 in total income, and \$248,582 in benefactions. In September, 1899, a unique exhibition was opened to the public in Copley and Allston Halls, comprising drawings by the pupils of more than fifty pub-

lic schools of the State, supplemented by contributions from the State Normal Art School, the normal and training schools, and the evening drawing schools. In 1899 there were 632 periodicals, of which 86 were dailies, 323 weeklies, 173 monthlies, and 23 quarterlies.

Finances.—In 1898 the assessed valuations of the State were: Real estate, \$2,182,596,651; personal property, \$1,371,419,131—total, \$3,554,015,782, an increase in a year of \$96,033,628; and of the cities, counties, and towns, \$2,764,242,784, an increase of \$61,914,730. The total funded debt of the State, January 1, 1899, was \$59,786,229; sinking funds aggregated \$15,189,152, leaving the net debt \$44,597,077, an increase in a year of \$6,923,241. The net debt of the cities, counties, and towns in 1898 was \$121,385,139; increase in a year, \$5,586,250.

Vital Statistics.—A feature of more than ordinary interest in the report of the State Board of Health for 1898 was the part relating to the mortality from the most fatal diseases, particularly consumption and diphtheria. For twenty-five years the general death rate of the State varied but little from 19.5; but in 1898 it fell to 17.5. This decrease, it is shown, was largely due to a better treatment of infectious and preventable diseases. The death rate from consumption in 1853 was 4272 per 1,000,000 persons; in 1895 it was 2194; and at present is considerably less. The establishment of a special State hospital for the isolation of persons under treatment for tuberculosis, the more vigorous enforcement of measures essential in combatting infectious diseases, a better knowledge on the part of the people of the art of prolonging life, a growing appreciation of sanitary science, and the organization and equipment of local health authorities, are cited as causes of the improvement.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 2,745,000.

Legislation.—By the statutes of 1899 bicycle paths are protected; a board of cattle commissioners was created with power to suppress contagious diseases, establish hospitals and quarantine and kill cattle incurably diseased, without compensation to the owner; the Bertillon method of identifying criminals was adopted; process butter must be stamped "Renovated butter"; collectors dressed in a way to attract attention are prohibited; desecration of the flag is prohibited; each town must elect a tree warden to care for public shade trees; weekly payment of wages is required, and eight hours is a day's work when employment is by municipalities; street railways are authorized to act as common carriers for packages and small parcels, and no bank shall do business as a trust company. An elaborate law was also enacted relative to the descent and distribution of personal property.

Party Platforms.—The Republican State convention met in Boston, October 6, 1899, and drew up a platform that congratulated the nation upon the auspicious results that had followed the restoration of the Republican party to power in all branches of the federal government; declared that the tariff law had proved adequate to meet the expenses of the government on a peace footing, and that the National Treasury Department had been administered in such a way as to restore stability to value and faith in the national credit; it demanded legislation for the development of the merchant marine, and favored making the principal harbors accessible to the largest vessels afloat; it expressed unqualified opposition to trusts and monopoly, and warmly commended the administration of President McKinley and of Governor Wolcott.

The Democratic State convention met in Boston, September 21, and its platform reaffirmed and endorsed the principles of the platform adopted by the Democratic national convention of 1896; renewed the demand for the free and unlimited coinage of both gold and silver at the ratio of 16 to 1; denounced unqualifiedly the purpose of the Republican party to surrender to the banks the governmental function of issuing paper money and controlling its volume; approved the war with Spain, but declared the "aggression in the Philippines" to be "wanton and needless"; denounced a large standing army as a "terrifying form of militarism"; pledged the Democratic party "to give due trial to such remedies as may hasten the disintegration of trusts"; demanded government ownership and operation of all railroads; endorsed Mr. Bryan; favored the election of United States senators by direct vote of the people, and the enforcement of an eight-hour workday; the abolition of the law granting a life tenure to members of the judiciary; and the public ownership and operation of street railways, water-works, and other municipal business enterprises.

The Prohibition platform declared that the entire production, transportation and sale of liquors for beverage purposes should be prohibited by law; that the laborer's deadliest enemy is the legalized saloon; that the citizens can, if they choose, entirely banish the liquor traffic; that prohibition will prohibit whenever citizens empower a party that wishes to enforce the law; that its candidates can be relied upon for a prudent and vigorous administration of all State affairs; that intelligence and not sex should qualify a voter; and that the Christian Sabbath should be better protected by law from secular encroachment. It denounced license, high

or low, or any system or regulation that gives protection to the drink traffic; the introduction of the liquor traffic in our newly acquired possessions; the retention of the army "canteen" by the government; the lawlessness known as "lynch law," and what it alleged to be moral weakness of the federal administration.

Elections.—The State offices to be filled by the election on November 7, 1899, were those of governor, lieutenant-governor, secretary, treasurer and receiver-general, auditor, and attorney-general. The Republican candidate for governor, W. Murray Crane, received 168,902 votes; the Democratic candidate, Robert Treat Paine, Jr., 103,802 votes; the Socialist-Labor candidate, George R. Peare, 10,778 votes; the Democratic-Socialist candidate, Winfield P. Porter, 8262 votes; the Prohibition candidate, Rev. Albert B. Coats, 7402 votes, and all others, 20 votes. The total vote cast was 298,246, and Mr. Crane was elected by a plurality of 65,100.

State Officers and National Representatives.—Governor, W. Murray Crane; lieutenant-governor, John L. Bates; secretary of State, W. M. Olin; treasurer, E. S. Bradford; auditor, John W. Kimball; adjutant-general, Samuel Dalton; attorney-general, H. M. Knowlton; secretary of the Board of Education, Frank A. Hill; secretary of the Board of Agriculture, James W. Stockwell; insurance commissioner, F. L. Cutting. Supreme Judicial Court for the Commonwealth: Chief Justice, Oliver W. Holmes; justices, Marcus P. Knowlton, James M. Morton, John Lathrop, James M. Barker, John W. Hammond, William C. Loring; clerk, Henry A. Clapp. The State legislature consists of 197 Republicans, 77 Democrats, 4 Independents, and 2 Socialist-Democrats. Senators: Henry Cabot Lodge, from Nahant, and George F. Hoar, from Worcester—both Republicans. Representatives: George P. Lawrence (Rep.), from North Adams; Frederick H. Gillett (Rep.), from Springfield; John R. Thayer (Dem.), from Worcester; G. W. Weymouth (Rep.), from Fitchburg; William S. Knox (Rep.), from Lawrence; William H. Moody (Rep.), from Haverhill; Ernest W. Roberts (Rep.), from Chelsea; Samuel W. McCall (Rep.), from Winchester; John F. Fitzgerald (Dem.), from Boston; Henry N. Naphen (Dem.), from Boston; Charles F. Sprague (Rep.), from Brookline; W. C. Lovering (Rep.), from Taunton; William S. Greene (Rep.), from Fall River.

MATHEMATICAL SOCIETY, AMERICAN, formed in 1888, reorganized 1894, to encourage and maintain an active interest in mathematical science. Publishes *Transactions* (quarterly) and *Bulletin* (10 months in each year). In 1899 had a membership of 337. President, R. S. Woodward; secretary, F. N. Cole, Columbia University, New York City.

MAURITIUS, a crown colony of Great Britain, is an island lying in the Indian Ocean, 500 miles east of Madagascar, having an area of 705 square miles, and a population, reported at the beginning of 1899, of 378,872, of whom 261,222 were East Indians. The remainder of the inhabitants are chiefly of French or of mingled French descent. The language spoken in large part is French. Dependencies of Mauritius are Rodriguez Island and the Seychelles, Almirante, Oil, and St. Brandon islands, the total area of which is 350 square miles, and the population about 17,000. The capital of Mauritius is Port Louis, with a population in 1898 of 54,223. Government is administered by a governor, who is assisted by an executive council of five officials and two elected members, and by a legislative council of twenty-seven members, of whom eight are ex-officio, nine nominated by the governor, and ten elected. The governor since 1897 has been Sir Charles Bruce, K.C.M.G. Instruction is largely supported by the government; the total expenditure for this in 1898 was 486,836 rupees. Of the public school population about 70 per cent. are Roman Catholics, 3 per cent. Anglicans, something over 1 per cent. belonging to other Christian churches, and about 25 per cent. Hindoos and Mohammedans; to the last two classes government assistance is not granted.

The chief sources of revenue are custom duties, licenses, and railways. The revenue and expenditure in 1897 amounted to 7,996,705 rupees and 8,626,798 rupees respectively; in 1898, revenue, 7,620,318 rupees; expenditure, 8,131,465 rupees. In the latter year the public debt was £1,195,691, and the paper money in circulation 3,404,250 rupees. The Indian rupee (value in United States currency about \$0.52) is used in accounts.

By far the most important industry is sugar culture, and most of the provisions needed, including rice, grain, flour, etc., are imported. The trade is chiefly with India. The total imports and exports, valued in rupees, in 1897 were 18,948,233 and 28,192,675 respectively; in 1898 the exports amounted to 31,866,437 rupees. Of the export for 1897, 22,327,650 rupees were accredited to unrefined sugar; aloe fibre, 242,507 rupees; vanilla, 136,620 rupees. The foreign tonnage entered in 1897 was 328,708 tons; cleared, 338,638 tons.

MAYFLOWER DESCENDANTS, SOCIETY OF, organized in 1894, a society of descendants of persons who sailed on the *Mayflower* to Plymouth Rock, Mass.,

in December, 1620. In 1899 the membership was about 2000. The officers of the New York Society are John Taylor Terry, governor, and Jeremiah Richards, secretary, 83 Grand Street, New York City.

MAZET, ROBERT, chairman of a conspicuous legislative committee authorized in 1899 to investigate charges of corruption in the government of New York City, is a native of Pittsburg, Penn. He was graduated at Columbia in 1881, and immediately began to practise law in New York. All his life he has been a Republican, and a staunch supporter of the workingmen. He was instrumental in securing the passage of a bill for the improvement of the West Side and Riverside Drive, New York; supported the Mechanics' Lien law for the protection of workingmen, and a bill for improvements in school advantages for the children of New York. Mr. Mazet is identified with charitable institutions, and is a member of the State Charities Aid Association. He was elected to the New York legislature in 1896, and was re-elected by a majority of over 3800 votes. The Mazet committee began its work on April 8. Mr. Richard Croker (*q. v.*) was one of the first witnesses examined. See NEW YORK.

MECHANICAL ENGINEERS, AMERICAN SOCIETY OF, incorporated in 1881, had in 1899 a membership of 1951. General meetings for 1900 at Cincinnati, May 14-18, and in New York, December 4-7. The society published in 1899 Vol. XX. of its *Transactions*. President, Charles H. Morgan; secretary, F. R. Hutton, 12 West Thirty-first Street, New York City.

MEDAL OF HONOR LEGION, an association of officers and enlisted men who were awarded medals of honor in the American Civil War, was organized in 1890, and has an estimated membership of about 500. Commander, Theodore S. Peck, Burlington, Vt.; adjutant, Llewellyn G. Estes, Washington, D. C.

MEDICAL ASSOCIATION, AMERICAN, held its fiftieth annual session at Columbus, O., June 6-10, 1899, at which the governor of the State and the mayor of the city delivered addresses of welcome. The president's address was upon *Our National Body; Its Purposes and Destiny*. Tuberculosis and kindred topics were discussed. The report of the treasurer showed the association to be financially in a prosperous condition. It was decided that there be no permanent secretary, but that the editor of the *Journal* perform a secretary's duties; provision was made for an assistant secretary. Officers elected: President, W. W. Kern, M.D., Philadelphia, Pa.; secretary, George H. Simmons, M.D., Chicago, Ill.

MEDICAL ASSOCIATION, BRITISH, held its sixty-seventh annual meeting at Portsmouth, England, August 1-4, 1899. Important papers were read by Professor Ogston on the *Medical Services of the Army and Navy*, in which he proposed certain reforms in the naval and military medical departments; and by Dr. G. Nuttall on the *Part Played by Insects, etc., in the Propagation of Infectious Diseases*. John Ward Cousins, M.D., F.R.S.C., was elected president.

MEDICAL PROGRESS IN 1899. Great activity was noticeable during the year in the department of bacteriology and materia medica. The investigation of the cause of contagious diseases, due in all probability to germs yet unidentified, was pushed by eager and able bacteriologists in many laboratories. (See BACTERIOLOGY; PLAGUE; SCARLET FEVER; SMALLPOX; SERUM AND SERUM THERAPY; YELLOW FEVER.) The materia medica of the clinician was enriched by several new or newly approved drugs. (See the articles ACOIN; ARECOLIN; ASTEROL; CHLORETON; OXYCAMPHOR; SUPRARENAL EXTRACT; THERMOL, and Kalagua, in article TUBERCULOSIS, paragraph Treatment.) The sufferings of many ill or wounded human beings were limited in one direction by an improved method of rendering the body insensible to pain. (See ANÆSTHESIA.) Widespread interest in tuberculosis and in the means of preventing its spread was aroused, and in many countries a veritable crusade against the disease was started. The need of special hospitals and of State care for the unfortunate victims of this scourge was realized in many localities, and societies for the study of its propagation and of means to limit its spread sprung into existence. (See TUBERCULOSIS.) The plague pursued its fatal course in its chosen home, India, and also spread dismay and disaster in China, Arabia, Japan, and Madagascar, and in a few other countries. Its appearance in New York harbor and in Honolulu awakened the liveliest concern among students of sanitary science and health officers. (See PLAGUE.) A very interesting and valuable series of experiments in the cure of disease with light is being carried on by Professor Finsen and his associates. This is the first time popular attention has been drawn to solar therapeutics since the absurd blue-glass craze in 1877. (See PHOTOTHERAPY.) By far the most important achievement of the year in medicine was the establishment of the fact that malarial fever is transmitted to man, and from man to man, by mosquitoes. (See MALARIAL FEVER AND MOSQUITOES.) The rôle of insects in the propagation of disease is being thoroughly studied, and many hitherto inexplicable cases of appar-

ently sporadic disease are traced to their source. (See INSECTS AND THE PROPAGATION OF DISEASE.) Other medical facts and news are found under their proper captions.

MEDICO-PSYCHOLOGICAL ASSOCIATION, AMERICAN, founded in 1844 as the Association of Medical Superintendents of American Institutions for the Insane. The object of the society is the study of all subjects pertaining to mental disease. It had in 1899 a membership of 354. Meetings are held and proceedings are published annually. Secretary, C. B. Burr, Flint, Mich.

MEDILL, JOSEPH, editor and proprietor of the *Chicago Tribune*, died at San Antonio, Tex., March 16, 1899. He was born near St. John, New Brunswick, April 6, 1823. When eight years old he removed with his parents to Massillon, O.; studied law at Canton, and was admitted to practice in 1846. In 1849, however, he entered journalism, taking charge of the *Coshocton Republican*, a Free-Soil paper. About two years later he established the *Cleveland Forest City*, a Whig organ. He was a supporter of General Winfield Scott, but rejected the Baltimore platform, which endorsed the Fugitive Slave law of 1850. He effected in 1852 a union of his paper with the *Free Democrat*, the new paper being the *Cleveland Leader*. In this he urged the disbanding of the Whig party and the formation of a party distinctly opposed to the extension of slavery; and in 1854 he was one of the twelve men who met in Cleveland to organize the new Republican party in Ohio. The following year, with two partners, he bought the *Chicago Tribune*, which immediately became a radical antislavery paper, and soon won a position of influence. Mr. Medill supported John C. Fremont in 1856 and Abraham Lincoln for the senatorship in 1858 and for the Presidency in 1860. He supported the war administration, but opposed President Johnson's plan of reconstruction. He favored the election of Grant in 1868. Mr. Medill was a prominent member of the Illinois constitutional convention in 1870. The following year President Grant appointed him on the first board of civil service commissioners; in 1872 he was elected mayor of Chicago. He bought a controlling interest in the *Tribune* in 1874, and became its editor-in-chief.

MÉLINE, FÉLIX JULES, French statesman, was defeated for the presidency of the republic, after the death of M. Faure, by M. Émile Loubet on February 18, 1899, by a vote of 483 to 279. M. Méline was born at Remiremont, in the Vosges, May 20, 1838. He became a lawyer in Paris, entered the chamber of deputies in 1872, and four years later was appointed under-secretary of state for justice. In 1883 he entered the cabinet of M. Jules Ferry as minister of agriculture, and in 1888 became president of the chamber. Subsequently he was chairman of the tariff commission, and expressed himself greatly in favor of the protective policy. After the fall of the ministry of M. Bourgeois he formed on April 28, 1896, a conciliation cabinet, which stood until June 15, 1898. During the Dreyfus affair M. Méline favored the anti-revisionists. He belongs to the Moderate Republican party.

MENELEK II, Emperor of Abyssinia and King of Shoa, was born in 1843, and in 1889 succeeded Johannes II. In the first year of his reign he concluded a treaty with Humbert, King of Italy, which placed Abyssinia under Italian protection. This "Ucciali Treaty" has occasioned much trouble, the advances of the Italians from Erythrea resulting in a war in 1895, in which Menelek was victorious. The Italian government, however, would not accept Menelek's demands for modifications of the Ucciali treaty and the retirement of the Italians, and in 1896 the latter were again defeated by Menelek at Adowa. Elated at having won a signal victory over a European nation, Menelek established diplomatic relations with France, Russia, and Great Britain. In the early part of 1899 Menelek was occupied in subduing the revolt of Ras Mangascia, governor of Tigré, who made formal submission to the Negus on February 18. Menelek claims to be a direct descendant of Solomon and the Queen of Sheba. He is an able and energetic ruler, and personally administers the government of his kingdom, in which he has promoted the advance of civilization.

MENINGITIS, CEREBRO-SPINAL. See VITAL STATISTICS.

MEROIER, AUGUSTE, a French general and former minister of war, and one of Dreyfus's chief accusers, was born in Arras, December 8, 1833. He was educated at the École Polytechnique, entered the artillery, and passed various grades, reaching that of general of division in 1889. His bravery at the siege of Puebla, Mexico, won him the decoration of the Legion of Honor. He served in the Franco-Prussian war, and was taken prisoner after the surrender of Metz, and after the war he took part in the battles of the Communards. For a while he commanded the artillery at Angoulême. Called by M. de Freycinet to the war office in 1889, he was conspicuous at Beauvais. In 1893 he commanded the eighteenth army corps at Bordeaux, and in that year was offered the post of minister of war, which office he held during the time of the Dupuy ministry. In 1895 he was given command of the fourth army corps stationed at Le Mans. He insisted on Dreyfus's guilt and summoned him before the

Council of War, which condemned him to life-long penal servitude (December 22, 1894). At the trial at Rennes in 1899 he still maintained his opinion. See FRANCE (paragraphs on History).

MERCURY. See QUICKSILVER.

MEREDITH, EDMUND ALLEN, LL.D., a Canadian leader of the prison reform movement and a brother to Sir W. Meredith, the late chief justice of Quebec, died in Toronto, Ontario, January 12, 1899. He was born at Ardtrea, County Tyrone, Ireland, October 7, 1817; was graduated at Trinity College, Toronto, 1837, and a few years later was admitted to the bar. He was made principal of McGill College, Montreal, in 1846, but he resigned the following year to become assistant provincial secretary of Upper Canada. He was under-secretary of state for the provinces after the confederation of 1867, and in 1873 was made first deputy minister of the interior; he retired in 1878. Dr. Meredith accomplished his most important work during his connection with the Canadian Prison Board, for which he served as inspector and later as chairman. He advocated the complete separation of prisoners in common jails, introduced the "crofter system" in penitentiaries, opposed the sending of children under fourteen years of age to county prisons, and effected various reforms in Canadian prisons and asylums. He published several pamphlets on social and literary subjects.

MERGENTHALER, OTTMAR, inventor of the linotype typesetting machine, died in Baltimore, Md., October 28, 1899. He was born in Würtemberg, Germany, May 10, 1854. In early life he came to the United States, found employment in the clock-making trade and afterward entered the electrical business. He then studied general machinery, and, though never a printer, began experiments to the end of making a machine to set type. These experiments continued for ten years, and finally were successful in 1886. Since then the linotype machine has been improved, but it is not greatly different from the one built by the inventor. This machine has revolutionized the printing trade, and is used in almost all large book-publishing and newspaper offices. From the invention large profits accrued to Mergenthaler.

MERRIAM, WILLIAM RUSH, ex-governor of Minnesota, was appointed by President McKinley on March 4, 1899, director of the Twelfth Census. Mr. Merriam was born at Wadham's Mills, Essex County, N. Y., in 1849; his family moved in 1861 to St. Paul, Minn., where he has since resided. After his graduation from Racine (Wis.) College in 1871, he began a clerkship in the First National Bank of St. Paul; two years later, when the Merchants' National Bank was organized, he was made its first cashier, and in 1880 was elected vice-president and in 1882 was advanced to the presidency, which position he still holds. In 1882 and 1886 Mr. Merriam was elected as a Republican to the State legislature, and during his second term was speaker. He was elected in 1888 governor of Minnesota, and was re-elected for the ensuing term. He has been active in educational and charitable work, and is regarded as a man of much business ability. The assistant director of the Twelfth Census is Mr. Frederick H. Wines, of Illinois.

MERRILL, SAMUEL, former governor of Iowa, died August 31, 1899. He was born at Turner, Me., August 7, 1822; was educated in the common schools, and in 1847 began business in New Hampshire. He entered politics and was twice elected to the legislature. In 1856 he removed to Iowa, and four years later was elected to the legislature in that State. In 1862 he entered the Union volunteer service, and received a colonel's commission. He was compelled to retire from the army on account of a severe wound received at Black River Bridge. Merrill was governor of Iowa from 1868 to 1872.

MERTEL, Cardinal TEODOLFO, died in Rome, Italy, July 11, 1899, at the age of 92 years. In 1858 he was raised to the Cardinalate, and at the time of his death was Vice-Chancellor of the Holy Roman Church.

METAMORPHIC ROCKS. Sederholm shows that a series of metamorphic, schistose, and crystalline rocks were originally true normal sediments laid down either in water or deposited by wind, and interbedded with lava flows. The region is in southwestern Finland, and the paper is a most important contribution to metamorphism, for it is often difficult to prove the sedimentary origin of such altered rocks.

METEORITES. Among the new discoveries of the past year may be mentioned six masses aggregating 100 hundred pounds from Choctaw and Sumter Counties, Ala., and another from Cherokee County, N. C. One specimen which fell at Allegan, Mich., on July 12, 1899, is found to consist mostly of olivine and enstatite, with particles of metallic iron scattered through it. A mass of meteoric iron of about three pounds weight has come from a place near Iredell, Bosque County, Tex. H. L. Ward describes a meteorite from Ness County, Kan., which

weighs 417 pounds. Cohen describes a number of meteoric irons, and gives analyses of them.

METEOROLOGY. The survey of the clouds undertaken at the suggestion of the international cloud commission has obtained many data which are of aid in the construction of a sound theory of the history of cyclones and anticyclones.

The report of the meteorological department of India for 1898-99 shows 174 stations. It is noted that the reports of the mountain stations cannot be used to any great extent for making up the prophecies for the lower lying regions, as local conditions affect the weather at these points. The report of the Cape of Good Hope commission shows that it was established in 1861, and that there are now in operation 2 first order stations, 54 second order, 17 thermometric, and 370 rainfall stations. Some of these are located in Orange Free State, the Transvaal, and other outside points.

M. Mamson has made an attempt to formulate the laws of climatic evolution, and comes to the conclusion that the present zonal distribution of climate is gradually increasing in temperature and extent; that there had been a gradual rise in temperature since the culmination of the ice age, in tropical latitudes; that preceding climates were independent of latitude, and were controlled by the internal or planetary heat of the earth; and that while the ice age was unique in the climatic history of the earth, still, local glaciations could have occurred during any period and in any latitude provided there were land areas sufficiently elevated.

Bilwiler believes that five varieties of winds should be classed as foehn winds—namely, those on the northern slopes of the northern valleys of the Alps; those on the southern side of the Alps, and known as the north foehn; a third class is one that takes place on both the northern and southern side of the Alps at the same time; a wind caused by the local hastening of a slowly down-setting current in the centre of an anticyclone may form the fourth class, and the fifth is the dry foehn-like wind which has been noticed blowing out of winter anticyclones.

In *Bulletin 26* of the Weather Bureau is discussed the electrification of the atmosphere, the loss of life and property by lightning, and the character of soil and vegetation as influencing lightning strokes.

Clayton, in studying weather periodicities, shows that there is a small range in the frequency of thunderstorms in the United States, the maximum being a few days before the greatest northern declination of the moon. He also notes that when the mean daily departures from the normal temperatures at the Blue Hill observatory from October, 1898, to February, 1899, are plotted, the minimum temperatures of October, December, January, and February occurred very near the times of the new moon.

It has been found that by careful observation of the amount of precipitation in the different watersheds of the Great Lakes and the manner in which the snows melt, it is possible to indicate approximately the level of the lakes. These inferences are, however, contingent on the maintenance of a constant cross-section and slope of the connecting channels.

Kite-balloon observations were carried on in France during the year 1899. At the observatory at Trappes altitudes of 3940, 3590, and 3300 metres were reached on the 14th and 15th of June, and the 3d of July. The kite meteorographs showed that in anticyclones the rate of decrease of the upper temperature becomes slower at a distance of a few hundred metres above the ground, and even inversions of temperature are at times noted. In cyclonic areas the decrease in temperature is more rapid. The wind velocity in fair weather and with high temperature often decreases with the altitude up to between 1500 and 3000 metres. On cloudy days, on the other hand, and with low pressure, the velocity tends to increase with the altitude. Of over 100 ascents made with *ballon-sondes*, 7 reached a height of over 14,000 metres, 24 higher than 13,000 metres, and 53 attained 9000 metres. The results obtained show that there was a much greater variation in temperature at high altitudes than was formerly supposed, and that annual variation occurred up to 10,000 metres, a maximum being reached toward the end of summer and a minimum toward the end of winter.

Professor Woodward, from his investigations of the physics of the atmosphere, states that the atmosphere extends at the equator 26,000 miles beyond the earth, and 17,000 at the poles. He also shows that the prevalent notion as to the weight of the atmosphere—namely, that it has the same weight as a shell of mercury 30 inches thick surrounding the earth, is erroneous, and he allows the mass of the atmosphere to range between 1-1200 and 1-10,000,000 of the mass of the earth.

Among the new text-books are *Grundlinien der maritimen Meteorologie*, by W. Koppen.

METEOROLOGY, ANCIENT DOCUMENTS ON. See ASTRONOMICAL PROGRESS.

METEORS, THE NOVEMBER. See ASTRONOMICAL PROGRESS.

METHODIST CHURCH, FREE, organized in 1860, has headquarters at Chicago; reports progress for 1899. A decision in a will contest in favor of the college at Greenville, Ind., which is under the denomination, will give that institution real estate in Shelby County, Ill., but leaves the college in debt as a result of the lawsuit. The latest report gives this sect 36 conferences, 500 ministers, and about 30,000 communicants.

METHODIST EPISCOPAL CHURCH. This church stands first in point of numbers of communicants among the Protestant churches of the United States. The year 1899 was one of prosperity in all things except the number of church members. The missionary society received more than ever before, a sum amounting to \$1,376,000, and large subscriptions have been received for the Twentieth Century Thank Offering, which is expected to reach \$20,000,000. Missionary work in all parts of the globe was pushed with gratifying results. In 1899, in the 17 Methodist denominations, there were 36,424 ministers, 53,023 churches, and 5,809,516 communicants. The latest report (1899) of the United States Commissioner of Education shows the Methodists to have 85 institutions of learning, with 873 professors; 8816 students, and endowment funds aggregating \$10,743,139. The next quadrennial conference of the Methodist Episcopal Church will be held May 2, 1900. There are reported 17 bishops of the church in the United States, a missionary bishop for India, and two missionary bishops for Africa.

METHODIST EPISCOPAL CHURCH, SOUTH. This division of the Methodist Episcopal Church reports for 1899 a prosperous year, without, however, any increase in church members, there being 5923 ministers, 14,160 churches, and 1,456,272 communicants, the last figure representing a loss of about 2000 church members. A large portion of the Twentieth Century Thank Offering of \$1,500,000 has already been subscribed. The next general conference will be held in 1902. The denomination has 11 bishops.

METHODIST PROTESTANT CHURCH, founded 1828, reports no great growth during the last four years. The number of ministers in 1899 was 1494, with 2352 churches and 179,507 communicants. The next general conference will meet at Atlantic City in May, 1900. Missions are carried on in Japan and China. The latest report of the United States Commissioner of Education shows the Methodist Protestant Church to have 3 institutions of learning, with 38 professors, 257 students, and endowment funds of \$50,000.

METHUEN, Third Baron. PAUL SANFORD METHUEN, major-general in the British army, was prominent after the outbreak of the Boer war in the fall of 1899 as the commander of the Kimberley relief column. Advancing from the south toward Kimberley, he defeated the Boers at Belmont, northern Cape Colony, on November 23, and two days later, at Gras Pan, he carried the Boer position at the point of the bayonet. On the 28th of the month he again attacked the enemy, who were strongly intrenched at the Modder River, and though the result was a victory for the English, General Methuen described the battle as "one of the hardest and most trying fights in the annals of the British army." The total British losses were reported as 471 officers and men. It was reported that Methuen himself was wounded. Reinforcements arrived on December 2, and on the 11th the Boers were again attacked at Magersfontein, north of the Modder. The British were repulsed after fierce fighting, sustaining a reported loss of 832 officers and men, including among the killed Major-General A. W. Wauchope and the Marquis of Worcester. After this crushing defeat General Methuen did little during the remaining weeks of the year. On December 28 his position was shelled by the Boers. See TRANSVAAL (paragraphs on History).

Lord Methuen was born September 1, 1845, and in 1864 became a lieutenant in the Scots Guards; in 1873 he served in the Gold Coast, and the next year was a brigade-major for the home army district. From 1877 to 1881 he was military attaché at Berlin, and from the latter year to 1884 served as assistant adjutant-general and assistant quartermaster-general for the home district, while in 1882 he was commandant at the headquarters in Egypt. In 1884-85 he commanded the field force in Bechuanaland, served in 1888 as deputy adjutant-general in South Africa, and became a major-general in 1890. He was in command of the home district from 1892 to 1897, when he was succeeded by Major-General H. Trotter. General Methuen has the following titles: Companion of the Bath, Companion of St. Michael and St. George, and Knight Commander of the Royal Victorian Order.

METROPOLITAN MUSEUM OF ART, organized in 1870, occupies a large building in Central Park, New York City, near Fifth Avenue and Eighty-second Street. The report of the trustees for the year 1899 shows that the museum incurred no debt, and that the expenses were \$128,155. The number of visitors exceeded that of the previous year by 28,662, the total number recorded being 540,060. The number

of members was 1973, against 1865 in 1898. Work on the new wing of the building was pushed forward during the summer, but was later delayed by a strike of the workmen employed. The number of permits issued to copyists in the departments of painting and sculpture and in the cast department was 1117. The year 1899 was a notable one for gifts received, among the more important being the sum of \$20,000, the income of which is to be used for the purchase of works of art; a silver vase presented by Mr. R. M. Grinnell; another, known as the "Magnolia vase," a bequest of \$25,000 from Charles E. Tilford; Turner's "Grand Canal at Venice," bequeathed by the late Cornelius Vanderbilt, and numerous other paintings, pieces of statuary, numismatic collections, and other objects of art. The Jacob H. Lazarus scholarship, amounting to \$1000, was awarded to Mr. Andrew T. Schwartz. A course of lectures on art was given in connection with Columbia University. The museum has a library of 5669 bound volumes, 156 portfolios, and 553 unbound and miscellaneous volumes. President, Henry G. Marquand; secretary, L. P. di Cesnola.

MEXBOROUGH, Fourth Earl of, JOHN CHARLES GEORGE SAVILE, M.A., died August 17, 1899. Born June 4, 1810, and educated at Trinity College, Cambridge, he sat in Parliament as a Conservative in 1831 for Gatton, and from 1835 to 1847 for Pontefract. He succeeded his father to the title in 1860. His heir is the Viscount Pollington, born in 1843.

MEXICO, a Spanish-American republic, touching the United States on the north and Guatemala and British Honduras on the south. The capital is Mexico.

Area and Population.—The 27 states, 2 territories and federal district comprising the country are classified as Atlantic states, Inland states, and Pacific states. The area of the first-named class is 124,692 square miles, and the population, according to the census of 1895, 1,594,848, making the average number of inhabitants a square mile 12.7. The inland states have an area of 316,125 square miles; population (1895), 6,704,073; inhabitants to the square mile, 21.2. The area of the Pacific states is 324,768; the population (1895), 4,321,038; inhabitants to the square mile, 13.3. The total area accordingly, with a few small islands, is 767,005 square miles, the total population (1895) 12,619,959, and the average population a square mile 16.4. Of the total population about one-fifth are whites, something more than two-fifths mestizos, and the remainder Indians; of the last two classes only a small proportion are civilized. Returns of the census of 1895 give the following populations for the principal cities: Mexico, 344,377; Puebla, 91,917; Leon, 90,978; Vera Cruz, 88,993; Guadalupe, 83,870; San Luis Potosi, 69,676; Monterey, 56,855; Pachuca, 52,189; Durango, 42,165; Zacatecas, 40,026; Merida, 36,720; Queretaro, 32,790; Oaxaca, 32,641; Morelia, 32,287; Aguascalientes, 31,619; San Juan Bautista, 27,036; Toluca, 23,648; Colima, 19,305; Jalapa, 18,173. Mexico is traversed by lofty mountains, many of which are snow capped. See GLACIERS.

Government.—The chief executive authority is vested by the constitution in a president, chosen by an electoral college for a term of four years, and assisted in his official duties by a cabinet, the members of which direct the following departments: The interior, foreign affairs, finance, war and marine, justice and public instruction, industry, colonization, and fomento, communications and public works. In case of disability on the part of the president, the congress elects an acting president. The president is General Porfirio Diaz, who was first elected in 1876, and whose fifth term will end November 30, 1900. The legislative power devolves upon a congress of two houses, a senate and a house of representatives, the former consisting of 56 members, two for each state and the federal district, the latter consisting of about 227 members, each nominally representing about 40,000 inhabitants. Both senators and representatives are elected by the direct suffrage of "all respectable male adults." The several states have their own constitutions and statutes, and elect their own governors and legislatures. Interstate customs duties are not allowed. Besides lower courts, civil and criminal, there are district courts with 32 judges, circuit courts with three judges, and a supreme court with 15 judges.

Army and Navy.—The army in 1897 consisted of 2068 officers and 30,075 men, about two-thirds being infantry. With reserves the war footing is reported at 151,500, while all able-bodied men between the twentieth and fiftieth years are liable for military service. The Mexican navy is small, antiquated, and of little value: it consists of two unarmored gunboats, two despatch boats, and the *Zaragoza*, a steel training cruiser of 1200 tons. For these vessels there is a complement of about 90 officers and 500 men. It is stated that five first-class torpedo boats and four gunboats are projected or building.

Finance.—Taxes and customs duties constitute the chief items of revenue, representing, respectively, about 45 per cent. and 40 per cent. of the whole. Budget estimates of revenues and expenditures in Mexican dollars have been as follows for fiscal years:

	1897.	1898.	1899.	1900.
Revenue.....	47,220,000	50,325,900	51,659,500	54,913,000
Expenditure.....	47,554,926	50,410,312	52,089,485	54,886,756

In his message of September 16, 1899, President Diaz stated that the actual ordinary revenue for the fiscal year exceeded \$59,000,000, while the budget estimate for the period had been \$51,659,500; the greater part of the increase was due to larger receipts from import customs and stamp taxation. In the budget for 1900 \$24,192,000 were expected from import and export duties and \$22,411,000 from internal taxation; among the expenditures, \$21,021,042 were allotted for the public debt and pensions and \$12,164,355 for war and marine. The aggregate revenues and expenditures of the several states in 1896 amounted, respectively, to \$14,971,057 and \$14,472,906 (Mexican currency), and of the several municipalities, \$11,779,976 and \$11,670,784, respectively. At the beginning of 1898 the external federal debt was \$105,374,689 (United States gold), mostly at 6 per cent. The internal debt, mostly at 3 per cent. and 5 per cent., including the floating debt of about \$1,473,000, amounted in 1897 to about \$88,400,000 (Mexican currency).

The nominal value of the Mexican coinage of silver and gold has been for fiscal years:

	1895-96.	1896-97.	1897-98.
Silver.....	\$22,634,788	\$19,296,009	\$21,427,057
Gold.....	565,786	453,474	459,219

The standard of value is silver, the silver dollar, or peso, being worth in United States currency on October 1, 1899, \$0.474. Except bank-notes there is no paper currency.

Conversion of the Foreign Debt.—In the summer of 1899 measures were taken for the conversion of the external debt. An article in the *Bulletin* of the Bureau of American Republics for July, 1899, stated that a formal contract had been signed "whereby Messrs. J. P. Morgan and Company, in New York; Mr. S. Bleichrener, the Deutsche Bank, the Dresdner Bank, in Berlin, and Messrs. J. S. Morgan and Company, in London, undertake the conversion of the entire foreign debt of the republic of Mexico—namely, 6 per cent. loans of 1888, 1890, and 1893, and the 5 per cent. Tehuantepec loan heretofore issued in London and Berlin, into a 5 per cent. consolidated external gold loan due within 45 years at par by semiannual drawings, which may be increased after the year 1909, the first one to take place in June, 1900, or by purchase in the market if same can be made under par. Principal and interest of the bonds payable in gold in Germany, London, Amsterdam, Berlin, or New York, in the last city at the rate of \$4.85 per pound sterling. Bonds to be issued in denominations of from £20 to £1000 at the option of the subscriber. The bonds are secured by a special hypothecation of 62 per cent. of the import and export duties of the republic of Mexico, such duties having amounted, as officially stated by the financial agent of the Mexican government in the years 1897-98, to \$22,582,437 silver, of which 62 per cent. would amount to over \$14,000,000 silver, and in 1898-99 (eleven months only) \$24,709,076, of which 62 per cent. would amount to over \$15,000,000. The annual interest and sinking fund requirement for the entire external debt of Mexico, as consolidated by the new issue of bonds, is about \$6,200,000 gold, or at present exchange about \$13,000,000 of silver, the total amount of the issue being £22,700,000, of which £5,000,000 are reserved for allotment in the United States and in Holland. The issue in England and Germany at the present time will be limited in favor of holders of the existing bonds, who will be given the right of conversion."

Industries.—Agriculture and mining constitute the principal industries. Although the climate and soil are suited to a large number of products, and the government encourages agricultural pursuits, still farming methods in general are in a backward condition. Business, however, in 1899, as well as the general financial condition of the country, was said to be good. The mineral wealth of Mexico is great, there being large deposits of gold, silver, iron, lead, copper, mercury, cobalt, tin, zinc, sulphur, antimony, coal, and petroleum; some of these, particularly silver and gold, have for many years been in process of exploitation, while others, as, for example, coal, it has not yet been profitable to mine in any considerable quantities. This is due largely to difficulties of transportation. Of the mining enterprises, about one-third belong to foreigners and the remainder to Mexicans. In 1898 Mexico took the first place among the silver-producing countries of the world. In 1899 there were in Mexico 8299 mining properties, divided among 20 classes, as follows: Silver, 4024; gold and silver, 1675; silver and lead, 1035; gold, 828; copper, 173; silver and copper, 156; iron, 99; mercury, 95; gold and copper, 54; silver and iron, 42; copper and iron, 22; sulphur, 20; lead, 19; antimony, 19; opal, 13; tin, 8; lead and iron, 7; copper and lead, 6; silver and magnesia, 2; rock salt, 2.

The values in Mexican currency of some of the more important products for 1897 were: Corn, \$87,233,671; wheat, \$18,680,475; various woods, \$17,860,128; sugar-cane, \$15,690,029; beans, \$12,692,336; cotton, \$12,026,010; coffee, \$8,282,038; henequin, \$7,394,519; barley, \$5,503,243; chick-peas, \$3,816,734; tobacco, \$2,985,924; ixtle, \$2,793,775; dye plants, \$2,378,063; rice, \$2,254,462; peas, \$1,685,779; gums and resins, \$690,922; white beans, \$668,475; cacao, \$565,808. The value in round number of all agricultural products raised in 1897 was reported to be \$261,500,000. One of the products of first importance is the henequin crop of Yucatan.

For the size of the country and the suitability of its soil and climate, Mexico's sugar output is very small, amounting annually to 70,000 to 90,000 tons, all of which is used in local consumption. One reason advanced for the meagre output is the fact that for the most part the methods of Mexican sugar planters are crude and antiquated. Manufacturing industries are few, and are concerned chiefly with sugar, cotton, and brandy. There are metallurgical works of importance at Durango, San Luis Potosi, and Monterey.

Commerce and Shipping.—The leading exports include silver, coffee, henequin, gold, woods, cattle, hides and skins, and tobacco; among the principal imports are cotton and woollen textiles, iron and machinery, provisions, spirits, and other alcoholic beverages. The following figures, representing Mexican currency, except for the imports, the values of which are given in gold, are for the foreign trade during fiscal years:

	Total Imports.	Exports.		Total Exports.
		Merchandise.	Precious Metals.	
1897.....	\$42,204,095	\$45,164,417	\$66,182,077	\$111,346,494
1898.....	43,603,492	53,930,417	75,042,332	128,972,749
1899.....	50,869,194	.....	.....	138,478,137

For the same years the values of the chief exports were as follows:

	Silver.	Coffee.	Henequin.	Gold.
1897.....	\$57,396,947	\$9,876,532	\$7,431,852	\$5,858,366
1898.....	65,074,260	10,649,119	11,564,519	6,364,308
1899.....	66,431,541	7,936,908	18,711,325	8,843,081
	Woods.	Cattle.	Hides and Skins.	Tobacco.
1897.....	\$3,518,950	\$3,575,476	\$2,903,229	\$2,720,091
1898.....	3,597,069	4,507,327	3,590,477	4,489,768
1899.....	.....	4,918,572	3,646,915	.....

The figures given above for silver include, besides the ordinary export, coin and ore. For 1899 also the lead and copper exports were valued in Mexican currency at \$3,786,144 and \$4,135,613, respectively. The foreign commerce with the United States far exceeds that with all other countries combined. The gold value of merchandise exported to the United States in 1898 was \$21,670,775, a gain over the four previous years, though less than the amounts for 1892 and 1893, which were, respectively, \$29,413,875 and \$32,372,998. The value in Mexican currency of the entire export to the United States in the fiscal year 1897 was \$86,742,951 (gold value, about \$41,116,158); in 1898, \$94,974,616 (gold value, about \$45,017,968); in 1899, \$103,553,486 (gold value, about \$49,084,352). Exports to other countries of trade importance for the last two fiscal years were valued in Mexican currency as follows:

	Great Britain.	France.	Germany.	Belgium.	Spain.
1898.....	\$14,775,638	\$5,320,016	\$6,995,733	\$1,556,090	\$1,231,342
1899.....	14,095,178	6,252,293	4,020,307	2,577,688	1,172,948

The gold value of imports from the United States to Mexico in the fiscal year 1898 was \$21,490,604; in 1899, \$24,164,687. The gold value of imports from the other important commercial countries was:

	Great Britain.	France.	Germany.	Belgium.	Spain.
1898.....	\$8,104,697	\$5,435,698	\$4,781,821	\$590,196	\$2,039,132
1899.....	9,211,221	5,917,167	5,677,925	707,408	2,969,936

There entered in the foreign and coasting trade in 1898 at the ports of the republic 10,527 vessels, aggregating 4,085,200 tons, and cleared, 10,452 vessels, aggregating 3,880,940 tons. In the same year the merchant marine consisted of 68 vessels, 17 steam and 51 sail, of 4081 tons and 9317 tons respectively.

Communications.—The length of railway lines in 1898 was reported to be 7750 miles; in 1899, according to a statement in the *Bulletin* of the Bureau of American Republics for December, the railways aggregated 13,369 kilometres (8307 miles).

In 1898 there were 1688 post-offices, 127 miles of tramway, 7459 miles of telephone lines, and 42,150 miles of telegraph lines, of which 28,220 miles belonged to the federal government. In the fall of 1899 there were reported 68,250 kilometres (42,408 miles), and 2457 post-offices.

Religion and Education.—The principle of religious toleration prevails in Mexico, and there is no state church, but Roman Catholicism is the preponderant faith. The proportion of Catholics to Protestants in the municipality of Mexico is more than 100 to 1. Primary instruction in most of the states is gratuitous and nominally compulsory. Education, however, as in most Latin-American countries, is in a very backward condition; in the capital in 1890 there were over 175,000 persons who could neither read nor write. There are schools for higher education and professional instruction. Primary instruction is directed by the states, the municipalities, the federal government, and various private organizations. The total number of schools in 1896 was reported to be 11,512, with an enrolment of 767,942, and an average attendance of 490,746, of which over three-fifths were boys. In the same year there were 102 public libraries, besides the national library of 159,000 volumes, and 531 newspapers, of which all but 15 were in Spanish.

The Yaqui Rebellion.—In July, 1899, the Yaqui Indians of the state of Sonora, in northwestern Mexico, began a formidable uprising against the governmental authority. Accounts both of the causes of the rebellion and of its progress during 1899 were meagre, and seemingly not of great reliability. The chief cause, however, appeared to be the encroachments of Mexicans on the Indian lands. Several severe engagements took place between government troops and the Indians in August and September, and intermittent fighting occurred up to the end of the year, at which time the Indians were still unsubdued. The casualties among the latter, however, were said to be many. Their fighting force was estimated to number about 5000, and at the outbreak of the trouble it was thought that their courage, combined with the very wild and mountainous nature of the country, would enable them to wage for some time a successful guerrilla warfare against the government. The Mexican forces were commanded by General Torres. The Yaquis, who probably number some 15,000 or more, were once a large and powerful tribe, and extended far within the present territory of the United States. They are a half-civilized people, being considerably further advanced than the neighboring tribes, and engage chiefly in hunting, mining, and agriculture. A spirit of independence is strong among them, and they have repeatedly made determined revolts against both Spanish and Mexican authority. As late as 1897 peace was concluded between them and the Mexican government, terminating an insurrection.

MIASKOWSKI, AUGUST VON, professor of political economy in Leipsic University, Germany, and an authority on political economy and international law, died November 23, 1899. He was born at Pernau, in Livonia, January 26, 1838. He studied law and political science at Dorpat, Heidelberg, and Berlin, and in 1873 was appointed as a lecturer at the University of Jena. He subsequently held professorships in the universities of Basel, Hohenheim, Breslau, and Vienna, and in 1891 was called to Leipsic, where his lectures attracted many students. Among his writings are: *Die Gebundenheit des Grundbesitzes und des Familienfideikommisses*, 1873; *Isaak Iselin*, 1875; *Die Verfassung der Land-, Alpen-, und Forstwirtschaft der deutschen Schweiz*, 1878; *Die schweizerische Allmend*, 1879; *Das Erbrecht und die Grundeigentumsverhältnisse im deutschen Reich*, 1882-84; *Agrarpolitische Zeit- und Streitfragen*, 1889.

MICA. The United States supply of mica in 1898 amounted to 124,520 pounds of sheet mica, valued at \$103,534. The States of North Carolina, New Hampshire, and South Dakota continue to be the sources of supply. The imports of mica, both crude and trimmed, amounted to 956,497 pounds, valued at \$150,082. The twentieth annual report of the United States Geological Survey contains an important description of the mica deposits of the United States by J. A. Holmes.

MICHAEL ALEXANDROVITCH, Czarevitch of Russia, who on the death of the Grand Duke George (July 10, 1899) became heir to the throne, was born in St. Petersburg, December 4, 1878. He was educated for the army, and is colonel of the One Hundred and Twenty-ninth Regiment of infantry. He is the Czar's only surviving brother.

MICHEL, Sir ARCHIBALD, K.C.M.G., was born in 1810 and died June 22, 1899. He studied law, became a barrister, Middle Temple, in 1838, and later was made a Queen's counsel in the bar of Victoria. He served as agent-general in England for Victoria, and in that colony as attorney-general and minister of justice.

MICHIGAN, a lake State of the United States, has an area of 58,915 square miles. The capital is Lansing. Michigan was admitted to the Union January 26, 1837.

Mineralogy.—During 1898 the State maintained the first rank as a producer of iron ore, and not only increased its output of 1897 by 1,259,383 long tons, but yielded 37.8 per cent. of the total production of the country. The output was 7,192,376 long tons of red hematite (ranking first in this species) and 154,470 long tons of magnetite (ranking fourth), a total of 7,346,846 tons, valued at \$10,368,807. In coal, the State had the largest output in its history—315,722 short tons, valued at \$462,711, an increase of 92,130 tons over the product of 1897, which was the largest of all previous years. There were 17 mines in operation during the year, and 8 more were opened near its close. In copper, the Lake Superior region had an output of 158,491,703 pounds, an increase in a year of 13,209,644 pounds, and its largest on record. The State was exceeded by Montana only in production. During 1899 all the mining camps felt the effects of the great copper boom. A number of abandoned and closed mines were reopened, and many of the largest interests sank new shafts and increased their stamp-mill facilities. In August the famous Calumet and Hecla plant was treating an average of upward of 4000 tons of rock daily, using 22 stamps, and was building a new mill of 6 stamps to treat the rock from the amygdaloid mine then being opened on the property. Shaft No. 12 of this plant was yielding rock running as high as 80 per cent. refined copper; so rich, in fact, that the rock was shipped direct to the smelter without being run through the stamps. The payment of the 113th dividend of the Calumet and Hecla corporation in December, 1899, brought the total dividends up to \$65,850,000 in a period of thirty-three years, an annual average of nearly \$2,000,000. Despite the flurry in copper stocks, the output of the mines in the first half of 1899 was only 1.3 per cent. above that of the previous corresponding period, and the second half made but little change in the relative proportions. In quarrying, the State had an output of sandstone valued at \$222,376, and of limestone valued at \$271,523.

Manufactures.—During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$4,643,795. There were 149 manufacturers of tobacco and 1233 of cigars, and the combined output was 134,799,726 cigars, 12,056,730 cigarettes, 5,995,616 pounds of plug tobacco, 2,814,071 pounds of fine cut, 6,858,945 pounds of smoking, and 84,990 pounds of snuff. The production of fermented liquors was 804,430 barrels. In 1898 the salt product from 53 works was 5,263,564 barrels, valued at \$1,628,081, an increase in a year of 1,270,339 barrels, but not sufficient to enable the State to regain the primacy in rank lost to New York in 1893. The output of pig-iron was 147,640 long tons, and of the total product of limestone about two-thirds was burned into lime.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the ports of entry and delivery of Detroit, Huron, Michigan, Superior, and Grand Rapids aggregated in value \$5,092,068; exports, \$28,736,925, a decrease in a year of \$256,433 in imports and increase of \$3,434,074 in exports. The trade in gold and silver was: Imports at Detroit and Huron, \$17,795; exports at Detroit, \$2462, making the total foreign trade of the year \$33,849,250, a net increase of \$3,191,467.

Transportation.—The new railway construction during 1898 was 147.77 miles, and during 1899, 149.20 miles, giving the State a total mileage of 8098.17. During the season of 1898 (April-October) the total registered tonnage that passed through the St. Mary's Falls Canal was 16,426,472, the smallest since 1894. Freight aggregated 18,509,048 net tons, and included coal, 3,288,410 net tons; flour, 6,113,966 barrels; wheat, 36,505,272 bushels; other grain, 21,253,440 bushels; copper, 105,180 net tons; iron ore, 10,834,454 net tons, and lumber, 799,501,000 board measure feet.

Banks.—On October 31, 1899, there were 80 national banks in operation and 89 in liquidation. The active capital aggregated \$11,490,000; circulation, \$4,859,356; deposits, \$58,092,434, and reserve, \$17,068,949. The State banks, June 30, 1899, numbered 188, and had capital, \$12,215,040; deposits, \$93,825,170, and resources, \$114,943,348; and private banks, 43, with capital, \$615,800; deposits, \$3,239,942, and resources, \$4,049,326. The exchanges at the clearing houses at Detroit, Grand Rapids, and Kalamazoo in the year ending September 30, 1899, aggregated \$458,321,274, a net increase of \$53,333,753 in a year.

Education.—At the close of the school year 1897-98, the school population was 703,730; enrolment in the public schools, 496,025, and average daily attendance, 347,714. There were 15,673 teachers, 7885 buildings used as school-houses, and public school property valued at \$18,138,589. The revenue (1896-97) was \$6,452,571; expenditure, \$6,281,003, of which \$4,152,879 was for teachers' salaries. There were 282 public high schools, with 999 secondary teachers, 27,458 secondary students, and 4667 elementary pupils; 21 private secondary schools, with 103 secondary teachers, 1207 secondary students, and 3092 elementary pupils; 3 public normal schools, with 94 teachers and 2096 students in all departments; and 3 private ones, with 15 teachers and 861 students. Normal training was also given in 7 colleges and 62 public high schools. Eleven colleges for men and for both sexes reported 3 fellowships, 51 scholarships, 367 professors and instructors, 5394 students, 226,661

volumes in the libraries, valued at \$290,662; \$612,212 invested in scientific apparatus, \$2,333,704 in grounds and buildings, and \$1,609,983 in productive funds; \$649,061 in total income, and \$252,851 in benefactions. Under an act of the legislature the annual income of the University of Michigan is to be enlarged by upward of \$92,000 by increasing the tax for its support from one-sixth to one-fourth of a mill on each dollar of assessed valuation. The total registration of the university in October, 1899, was 3187, and the total number of persons in the faculty, 222. The city of Ann Arbor in 1899 gave the university ground for which it paid \$17,000 for a site for the new homœopathic hospital, and contracts were signed for the building, to cost \$48,670. In 1899 there were 808 periodicals, of which 67 were dailies, 628 weeklies, and 84 monthlies.

Finances.—The last fifth-year assessed valuations, in 1896, were: Real estate, \$805,553,976; personal property, \$140,455,965—total as assessed, \$946,009,941; total as equalized, \$1,105,100,000, a decrease from the equalized valuation in 1891 of \$24,900,000. On July 1, 1899, the bonded debt was \$500,000 in 1898 war-loan bonds, and \$10,992 in non-interest-bearing bonds that have never been presented for payment. What is known as the trust-fund debt was \$6,120,003 on the same date.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 2,385,000.

Elections, etc.—There were no State elections in Michigan, but the municipal elections on April 3 showed heavy Democratic gains in some of the larger cities—Detroit, Grand Rapids, Saginaw, Jackson, and Kalamazoo—but not in the smaller cities and rural districts. Toward the end of June some political excitement was aroused by the announcement of an alliance between Governor Pingree and Secretary of War Russell A. Alger, with the avowed purpose of compassing the defeat of James McMillan (Rep.) for re-election to the United States Senate. The basis of the combination included a declaration against trusts and in favor of the election of United States senators by direct vote of the people. On September 8, however, General Alger, in a letter addressed to one of his active adherents, announced his definite retirement from the senatorial contest for reasons "personal and of a business nature."

Detroit Street Railways.—The experiment in municipal ownership of railroads attempted in Detroit ended in failure. An act of the legislature authorized the Board of Aldermen of Detroit to appoint a commission to purchase the street railways of that city. The commission appointed, consisting of Governor Pingree, chairman, Eliot G. Stevenson (Dem.), and Charles E. Schmidt (Rep.), petitioned the city council for a franchise, but the petition was laid on the table. The constitutionality of the law was now questioned, primarily on the ground that it conferred on the city the right to engage in a work of internal improvement contrary to the provisions of the constitution. A test case was submitted to the Supreme Court of the State, which sustained the above objection, and early in July declared the law unconstitutional. It held that the meaning of the term internal improvements, as employed in the constitution, plainly included the street roads existing in Detroit. This decision, while pleasing to the opponents of the principle of municipal ownership, was held by some to establish a dangerous precedent in extending the term internal improvements to cover such cases. It was said, for example, that "if the inhibition which rests upon the State in regard to internal improvements also applies to the cities and villages of the State, all the well-known local conveniences and improvements now existing in the State are without warrant in law and have no legal standing." In spite of the finding of the court, Governor Pingree and two others undertook to purchase the lines, and to have the city guarantee the bonds on the understanding that if the roads did not pay they were to revert to the owners. They also promised a 3-cent fare. This scheme, which would have amounted virtually to municipal ownership, aroused popular opposition, and was not carried out. The 3-cent fare, which had been tried as an experiment, was given up and the regular 5-cent rate restored.

Legislation.—The Anti-Trust law enacted by the legislature of 1899 was regarded as a striking feature of the session. The law first defines minutely what constitutes a trust, and then imposes a heavy penalty for each violation. According to this law, no one can engage with another to sell his goods at any definable price, and if a man is undersold by any combination of capital, skill, and art, he can recover twice the profit he might have made, because the underselling is an effort to prevent competition. Other legislation imposed a tax of 3 per cent. on the gross earnings of express companies within the State, and 2½ per cent. on those of telephone companies, and levied a 5-per-cent. tax upon all bequests of over \$500 to other than heirs, certain relatives, and regularly adopted children; it also created a State board of assessors to assess the property of railroad, express, telegraph, and telephone companies; taxes were authorized to pay for the care of needy soldiers and for funeral expenses. An inspector of coal mines is to be appointed to see to

their safety, a State forestry commission was established, and a State free library board was created. Physicians, surgeons, barbers, horseshoers, and veterinarians are to be examined, and the first four licensed. Interest was reduced to 5 per cent., but by contract may be 7. Laws in the interests of the laboring classes were passed, and another law, defining a mob and lynching, declared that the person injured and the legal representatives of one killed by lynching may recover from the county to the extent of \$5000, the county having recovery over against the parties guilty of lynching. The State board of medical examiners are to issue diplomas.

State Officers and National Representatives.—Governor, Hazen S. Pingree; lieutenant-governor, O. W. Robinson; secretary of state, Justus S. Stearns; treasurer, George A. Steel; auditor, Roscoe D. Dix; attorney-general, Horace M. Oren; superintendent of public instruction, Jason E. Hammond; insurance commissioner, Harry H. Stevens. Supreme Court: Chief justice, Robert B. Montgomery; associate justices, Frank A. Hooker, Joseph B. Moore, Charles D. Long, Claudius B. Grant; clerk, Charles C. Hopkins. The State legislature consists of 119 Republicans and 13 Democrats. Senators: Julius C. Burrows, from Kalamazoo, and James McMillan, from Detroit—both Republicans. Representatives: John B. Corliss, from Detroit; Henry C. Smith, from Adrian; Washington Gardner, from Albion; E. L. Hamilton, from Niles; William A. Smith, from Grand Rapids; Samuel W. Smith, from Pontiac; Edgar Weeks, from Mount Clemens; J. W. Fordney, from Saginaw; Roswell P. Bishop, from Ludington; R. O. Crump, Bay City; William S. Mesick, from Mancelona; Carlos D. Sheldon, from Houghton—all Republicans.

MICHIGAN, UNIVERSITY OF, at Ann Arbor, Mich., was opened in 1841. During the academic year ending September 30, 1899, no very important changes were made in the methods or range of instruction. The Law Department found its convenience admirably subserved by its new and spacious building, providing well-lighted and well-ventilated library room, and lecture rooms attractive and commodious. The Homœopathic Medical College had a fairly successful year; in its hospital 1218 patients were treated in the public clinics. The Dental Department had as many students as it could accommodate; no less than 8000 persons were treated in the dental clinics of the year. The libraries were increased by the addition of 10,254 volumes. By an act of the legislature of 1899 the appropriation for the aid of the university was raised from the tax of one-sixth of a mill to that of one-fourth of a mill, thus increasing its annual income by about \$92,500. In November, Mr. Henry P. Glover, of Ypsilanti, Mich., gave to the university the De Criscio collection of Latin inscriptions, including more than 250 inscriptions on marble, besides a few on brick, lead pipe, and other materials, and ranging in age from the time of Augustus to the fifth century, A.D. For statistics, see **UNIVERSITIES AND COLLEGES**.

MICROSCOPICAL SOCIETY, AMERICAN, for the encouragement of microscopical research, was organized in 1878, and incorporated in 1891. In 1899 the society had 350 members, and published Vol. XX. of its *Transactions*. General meeting for 1900, in New York, June 27-30. President, A. M. Bleile; secretary, Henry B. Ward, Lincoln, Neb.

MILES, WILLIAM PORCHER, was born in South Carolina, July 4, 1822; died at Burnside, La., May 11, 1899. After his graduation from Charleston College, he studied law, but later was called to the chair of mathematics in his alma mater. He represented his State in the United States Congress, and, after secession had become a fact, in the Confederate Congress. Later, in the progress of the war, he was a colonel on the staff of General P. G. T. Beauregard. After the war Miles became president of the University of North Carolina. This position he subsequently resigned to take charge of sugar fields in Louisiana. His wife had inherited thirteen sugar plantations in this State, and Miles became the second largest sugar producer in the United States. At the time of his death he was president of the W. P. Miles Planting and Manufacturing Company.

MILITARY ORDER OF FOREIGN WARS was organized in New York in 1894, the National Commandery in 1896, the membership being composed of veterans or descendants of veterans who served in the Revolutionary War, the War of 1812, the war with Tripoli, the Mexican War, or the war with Spain. Commanderies have been established in New York, Pennsylvania, Connecticut, Illinois, California, Massachusetts, Florida, Maryland, District of Columbia, Ohio, Missouri, and Vermont. The officers of the general commandery are: Commander-general, General A. S. Webb; secretary-general, James H. Morgan, St. Paul Building, New York City.

MILK. The new milk law, adopted by the city of Boston, became operative June 1, 1899. Producers as well as sellers of milk, when applying for the necessary licenses, must state whence the milk comes, and give certificates to the effect that

the cows have been examined within the year, and that the milk is not stored or handled in a place where either horses or cows are kept. Storekeepers are not allowed to put a can of milk on floor or counter, out of which to serve to customers, but are required to keep it in a covered ice-box. Milk found to be unclean is destroyed. Cases of contagious diseases in the families of farmers, milk-peddlers, or storekeepers necessitate the immediate cessation of their selling milk in Boston.

Dr. Rowland G. Freeman, of New York, asserts that about 99 per cent. of the bacteria found in milk rise to the top with the cream, possibly because they are carried up by the fat globules as they rise, or because there are richer food and more oxygen at the surface. He therefore suggests, to avoid raising the milk as a whole to 155°, that the cream be sterilized and then returned to the raw milk.

Dr. G. Leslie Eastes, of London, reports in the *British Medical Journal* in November, 1899, his results from bacteriological and microscopical examination of 186 samples of milk. He found tubercle bacilli in eleven samples, possibly in two others. In 47 he found pus; in 77 others he found muco-pus. In 11 cases the presence of pus was doubtful. Blood was found in 24 samples, was probably absent in 85, and was absent in 77 samples. Streptococci were found in 106 cases. In short, about 80 per cent. of the samples examined were unfit for human food.

H. E. Annett, published in the London *Lancet*, in November, 1899, the results of his experimental studies of boric acid and formalin as preservatives of milk. He concludes that they are very injurious to the health of the consumer, and especially so to infants. He believes that a large proportion of the fatal cases of summer diarrhoea owe their origin to the pernicious practice among dairymen of systematically treating the milk during hot weather with preservatives. See **SERUM THERAPY**.

MILLER, LEWIS, inventor of agricultural implements, died in New York City, February 17, 1899. He was born in Greentown, O., in 1829; his home at the time of his death was in Akron, O. Miller's inventive ability was turned chiefly to reaping and binding, mowing, and threshing machines. In 1874, with Mr. John H. Vincent, he founded the Chautauqua Assembly, and was its president until he died. To this organization he gave large sums, and also to various charitable enterprises, and churches and Sunday-schools, irrespective of denomination.

MILLÖCKER, KARL, musician and composer, died in Vienna, Austria, December 31, 1899. He was born there May 29, 1842. He composed many operettas that attained wide popularity. Among these are *The Beggar Student*, 1882; *The Black Hussar*, 1884; *Poor Jonathan*, 1890.

MILNER, Sir ALFRED, M.A., G.C.M.G., governor of Cape Colony and high commissioner of South Africa since 1897, was educated in Germany, at King's College (London), and at Balliol College (Oxford). In 1881 he was admitted to the bar in the Inner Temple, and from 1882 to 1885 was chiefly engaged in journalism, writing for the *Pall Mall Gazette* and other London papers. In the latter year he stood unsuccessfully for Parliament in the Harrow Division. From 1887 to 1889 he was private secretary to the chancellor of the exchequer, and during the next three years was under-secretary for finance in Egypt. The latter experience enabled him to write *England in Egypt*, which is said to be the best book that has been published on the Anglo-Egyptian situation. From 1892 to the year of his appointment to South Africa he was chairman of the board of inland revenue. The negotiations preceding the outbreak of the Boer war brought Milner into prominence in 1899. See **TRANSVAAL** (paragraphs on History).

MIND CURE. See **SUGGESTION**.

MINERALOGY. The number of new species which have been noted during the past year is large and comprises the following: *Arzrunite*, a basic lead sulphate and copper chloride; *Batavite*, a hydrated magnesium aluminium silicate from Bavaria; *Carnotite*, a vanadate of potassium and uranium from Colorado; *Cedarite*, a fossil resin from the Saskatchewan River, Canada; *Cuprogoslarite*, a new variety of zinc sulphate; *Federovite*, a new variety of pyroxene; *Glauchroite*, a lime, manganese silicate; *Goldschmidtite*, a telluride of gold and silver; *Grünlingite*, a sulphotelluride of bismuth from England; *Hancockite*; *Hardystonite*, a silicate of lime and zinc; *Ktypeite*, a name given by Lacroix to certain pisolitic forms of calcium carbonate; *Lageriolite*, a lime soda aluminium silicate, produced artificially; *Loranskite*, a new tantalate from Finland; *Mossite*, a nisbo-tantalate of iron from Norway; *Nasonite*, a silico-chloride of lead and lime; *Philipstadite*, a new variety of amphibole; *Planoferrite*, a hydrated ferric sulphate from Atacama, Chile; *Rafaelite*, a lead oxychloride from Chile; *Senaite*, an oxide of iron, lead, titanium, and manganese from Brazil; *Stelznerite*, a mixed hydrate and sulphate of copper from Chile; *Stokesite*, a hydrated silicate of sodium and lime; *Thalenite*, a new yttrium silicate from Sweden; *Van Diestite*, a telluride of bismuth and silver from Colorado; *Valleite*, from Edwards, New York.

K. von Kraatz-Kaschlaw has found that the coloring matter of many minerals is

not due to the presence of metallic impurities, as formerly supposed, but to the inclusion of varying percentages of carbonaceous matter. This includes minerals like smoky quartz, fluorite, apatite, barite, zircon, amethyst, etc. In the case of fluorspar he found that on heating the mineral to drive off the carbon a dark violet crystal changed through green to light violet or pink as the heating continued. The gas, which was driven off, he collected and identified.

Professor Morozewicz has published the results of five years experimenting on the formation of minerals in magmas. He has succeeded in not only producing artificially a number of minerals and rocks, but also in discovering the conditions governing their formation.

L. J. Spencer states that the number of mineral species discovered in England up to the present date is 293.

The first appendix to the sixth edition of Dana's *System of Mineralogy*, which appeared in the early part of 1892, has been issued. Other books of the year are: *Manual of Determinative Mineralogy and Blowpipe Analysis*, by G. J. Brush, revised by S. L. Penfield; *The Characters of Crystals: An Introduction to Physical Crystallography*, by A. J. Moses; *The Progress of Mineralogy in 1898*, by Herbert and Withrow; *Minerals of Mexico*, Bulletin of the Mexican Geological Institute.

Much work is being done in determining more correctly the chemical formulae of many mineral species. The following papers bear mostly on this: *On the Chemical Composition of Parisite and a New Occurrence of it in Ravalli County, Mont.*, by Penfield and Warren; *The Constitution of Tourmaline*, by F. W. Clarke; *On the Separation of Alumina from Molten Magmas and the Formation of Corundum*, by J. H. Pratt; *Experiments Relative to the Constitution of Pectolite, Pyrophyllite, Calamine, and Alalcite*, by Clarke and Steiger; *The Mineralogical Structure and the Chemical Composition of the Trap of Rocky Hill, N. J.*, by A. H. Phillips; *Melenite, Coloradite, Petzite, and Hessite*, by W. F. Hillebrand; *Roscoelite*, by Hillebrand and Turner; *A Comparative Study of Etch Figures; The Amphiboles and Pyroxenes*, by R. A. Daly, proceedings American Academy of Arts and Science, XXIV., and on a *New Variety of Hornblende, ibid.*; *On a Hydromica from New Jersey*, by Clark and Darton.

MINERAL PAINTS. The statistics for 1898 include the same substance as last year, and in addition graphitic shale, which was mined near Cartersville, Ga., and used for coloring fertilizer:

Variety.	Quantity Short Tons.	Value.	Variety.	Quantity Short Tons.	Value.
Ochre.....	11,963	\$123,833	Venetian red.....	10,271	\$160,711
Umber.....	1,177	8,285	Zinc white.....	33,000	2,320,000
Sienna.....	689	11,140	Soapstone.....	100	800
Metallic paint.....	20,972	263,979	Slate.....	4,571	46,315
Mortar color.....	7,107	74,894	Others.....	2,000	6,000
			Total.....	91,850	\$3,004,856

MINERAL WATERS. For the year 1898 the United States Geological Survey reports 28,853,464 gallons of mineral water valued at \$8,051,833, with an average price of 27.9 cents a gallon. The total number of springs which have been reported was 484. In 1899 appeared the work *Recherche, Captage et Amonagement des Sources Thermi minérales*, by L. De Launay.

MINING. The United States Geological Survey has issued during the past year the two following tables, one giving the detailed mineral production for 1898, the other the total metallic and non-metallic minerals from 1880 to 1898 inclusive.*

PRODUCTS.	1898.	
	Quantity.	Value.
<i>Metallic.</i>		
Pig-iron, spot value (a)..... long tons (b).....	(c) 11,773,984	\$116,587,000
Silver, coining value (d)..... troy ounces.....	54,433,000	(d) 70,364,485
Gold, coining value (e)..... do.....	3,118,398	64,463,000
Copper (f), value at New York City..... pounds.....	536,512,987	61,865,275
Lead, value at New York City..... short tons (g).....	222,000	16,650,000
Zinc, value at New York City..... do.....	115,399	10,385,910
Quicksilver, value at San Francisco..... flasks (h).....	31,082	1,188,627
Aluminium (i), value at Pittsburg..... pounds.....	5,900,000	1,716,000
Antimony, value at San Francisco..... short tons.....	(j) 1,130	184,050
Nickel (k), value at Philadelphia..... pounds.....	13,411	4,894
Tin..... do.....	(none.)	.....
Platinum, value (crude) at San Francisco..... troy ounces.....	225	1,913
Total value of metallic products.....		\$343,400,933

* Partly estimated production for 1899 are given in the separate articles on the minerals.

PRODUCTS.		1898.	
		Quantity.	Value.
<i>Nonmetallic (Spot Values (a)).</i>			
Bituminous coal (b).....	short tons.....	166,592,023	132,596,313
Pennsylvania anthracite.....	long tons.....	47,663,075	75,414,537
Stone (m).....			36,607,264
Petroleum.....	barrels (n).....	55,364,233	44,193,359
Natural gas.....			15,296,813
Brick clay.....			9,000,000
Clay (all other than brick).....	long tons.....		1,000,000
Cement.....	barrels (o).....	12,111,206	9,859,501
Mineral waters.....	gallons sold.....	26,853,464	8,051,833
Phosphate rock.....	long tons.....	1,308,895	3,453,490
Salt.....	barrels (p).....	17,612,634	6,312,554
Limestone for iron flux.....	long tons.....	5,275,819	2,639,000
Zinc white.....	short tons.....	83,000	2,310,000
Gypsum.....	do.....	291,638	753,280
Borax.....	pounds.....	16,000,000	1,120,000
Mineral paints.....	short tons (q).....	58,850	694,858
Grindstones.....			499,769
Fibrous talc.....	short tons.....	54,356	411,430
Asphaltum.....	do.....	76,837	675,649
Soapstone.....	do.....	22,231	267,112
Precious stones.....			160,920
Pyrite.....	long tons.....	193,864	593,801
Corundum and Emery.....	short tons.....	4,064	275,064
Oilstones, etc.....	pounds.....		180,728
Garnet for abrasive purposes.....	short tons.....	2,967	26,850
Mica.....	pounds.....	Sheet, lbs. 129,530 Scrap, tons. 3,999	103,534
Barytes (crude).....	short tons.....	81,306	27,564
Bromine.....	pounds.....	486,979	106,839
Fluorspar.....	short tons.....	7,675	126,614
Feldspar.....	long tons.....	12,000	63,080
Manganese ore.....	do.....	15,937	32,295
Flint.....	do.....	19,120	129,135
Monazite.....	pounds.....	250,776	43,670
Graphite.....	do.....	Crystalline, lbs. 2,360,000 Amorphous, tons. 890	13,542
Bauxite.....	long tons.....	25,149	75,200
Sulphur.....	short tons.....	1,300	75,437
Fuller's earth.....	do.....	14,880	32,960
Marls.....	do.....	60,000	106,500
Infusorial earth and Tripoli.....	do.....	2,733	30,000
Pumice stone.....	do.....	600	16,591
Millstones.....			13,300
Chromic iron ore.....	long tons.....	(none.)	25,294
Cobalt oxide.....	pounds.....	7,848	(none.)
Magnetite.....	short tons.....	1,263	11,772
Asbestos.....	do.....	605	19,076
Rutile.....	pounds.....	140	10,300
Ozocerite, refined.....	do.....	(none.)	700
Total value of nonmetallic mineral products.....			\$353,419,785
Total value of metallic products.....			343,400,955
Estimated value of mineral products unspecified (r).....			1,000,000
Grand total.....			\$697,820,720

(a) By "spot" value is meant value at the point of production.

(b) Long tons are tons of 2,240 avoirdupois pounds; short tons are tons of 2,000 avoirdupois pounds.

(c) Iron ore 1892: 16,296,666 long tons; value at mines: \$33,204,896. 1893: 11,587,639 long tons; value at mines: \$19,265,973. 1894: 11,579,679 long tons; value at mines: \$13,577,325. 1895: 15,967,614 long tons; value at mines: \$18,319,664. 1896: 16,006,449 long tons; value at mines: \$22,738,069. 1897: 17,518,046 long tons; value at mines: \$18,963,221. 1898: 19,433,716 long tons; value at mines: \$23,060,887.

(d) Figures of production furnished by the Bureau of the Mint, Treasury Department. Coining value \$1.2222 per troy ounce. Commercial value, 1896: \$36,445,000. 1896: \$36,655,000. 1897: \$33,316,000 1898: \$32,118,430.

(e) Figures of production furnished by the Bureau of the Mint, Treasury Department. Coining value, \$20.6718 per troy ounce.

(f) Including copper made from imported pyrites.

(g) The product from domestic ores only.

(h) Of 76½ avoirdupois pounds net.

(i) Including aluminium alloys.

(j) Includes antimony smelted from imported ores, in 1896, 80 per cent.

(k) Including nickel in copper-nickel alloy, and in exported ore and matte.

(l) Including brown coal and lignite, and anthracite mined elsewhere than in Pennsylvania.

(m) Not including limestone for iron flux or grindstones.

(n) Of 42 gallons.

(o) Of 300 pounds for natural cement, and 400 pounds for artificial Portland.

(p) Of 230 pounds net. The reduced price in 1893 is due to omitting cost of packages.

(q) Including metallic paints, ochre, umber, venetian red, sienna, ground soapstone, ground slate, and mineral black.

(r) Including building sand, glass sand, iron ore used as flux in lead smelting, tin ore, nitrate of soda carbonate of soda, sulphate of soda, and alum clays used by paper manufacturers.

	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.
Metallic products.....	\$190,089,865	\$192,892,408	\$319,735,109	\$203,128,659	\$186,109,599	\$181,586,587	\$214,387,435	\$246,925,054	\$253,731,823
Nonmetallic products.....	173,279,135	206,783,144	231,340,150	243,512,214	221,879,506	241,312,093	230,066,769	270,969,430	296,150,114
Unspecified ..	6,000,000	6,500,000	6,500,000	6,500,000	5,000,000	5,000,000	800,000	800,000	900,000
Total.....	\$369,319,000	\$406,175,552	\$457,595,259	\$453,441,073	\$413,989,105	\$427,898,680	\$445,784,594	\$520,714,474	\$550,781,936

	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.
Metallic products.....	\$287,247,083	\$305,735,570	\$300,292,798	\$307,716,299	\$249,981,866	\$219,168,788	\$261,913,639	\$297,595,906	\$302,188,502	\$343,400,907
Nonmetallic products.....	283,623,812	312,776,503	321,707,946	339,958,943	323,316,020	377,455,351	338,345,861	383,982,310	387,653,487	333,419,735
Unspecified.....	1,080,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Total.....	\$550,870,845	\$619,512,173	\$623,000,644	\$648,675,061	\$574,299,886	\$598,624,139	\$601,259,000	\$682,583,216	\$690,843,929	\$697,820,700

MINING ENGINEERING. The problems arising in the mining of ores and their reduction to metal for the most part fall under one or another of the following heads: (1) Mining geology, (2) mining engineering, (3) metallurgy, and (4) mechanical engineering. The second and fourth subjects are more particularly the province of the engineer, the first subject comes within the field of the geologist, and the third within that of the metallurgist. From the engineering point of view the limit of the possibilities in drainage, hoisting, power transmission, ventilation, etc., extends to a point far beyond the limits established by commercial conditions.

Drainage.—Drainage is one of the least determinable factors in mining. The influx of water may be confined to the upper levels of the mine, in which case it is comparatively easy to remove, or it may increase progressively with the depth, in which case the cost of drainage rapidly increases, and may become prohibitive to commercial operation. For deep level-pumping, particularly where the shaft deflects from the vertical, the tendency of modern mining practice is to employ electrical operative pumps.

Hoisting.—The depths from which ore is hoisted in mining operations to-day greatly exceed those of only a few years ago, and modern hoisting machinery has to be designed in many cases to work from depths of from 3000 feet to 6000 feet. As yet the steam engine has full possession of the field as the motor for hoisting machinery, but the claims for electricity are becoming increasingly great, and engineers are beginning to give it consideration as a promising substitute for the older form of motor. Modern improvements in the manufacture of a high quality of wire rope have made it possible to reach the great depths referred to as far as the rope is concerned, and the chief problem for the engineer is to design the hauling machine and subsidiary appliances for handling these long ropes with their loads. To wind these very long ropes on a drum without over-laying requires a drum very large and inconvenient to operate. Several plans have been adopted to solve the difficulty. One of these is the use of flat ropes wound on themselves, but there are objections to flat ropes because of their larger size and weight and greater wear, and because they are inadmissible on inclines. Another solution is to divide the shaft into two compartments virtually, and, instead of winding the rope on the drum, simply pass it around the drum so that one end with the bucket attached is unwound down one compartment, while the other end similarly loaded is wound up from the other compartment. By this method the two buckets see-saw up and down alternately. Various sheave, drum, and counterbalance arrangements are employed with this system. The hoisting speed in modern deep-mine working runs as high as 3600 to 5000 feet per minute.

Power Transmission.—The transmission of power in modern mining is accomplished by compressed air and electricity. Compressed air is used for operating drilling machinery and for running emergency and shaft-sinking pumps. For operating fixed interior drainage pumps (see paragraph Drainage) and for lighting, ventilating, and signalling, electricity is employed. The electric drill has not succeeded in supplanting compressed air drills to any great extent.

Ventilation.—One great need for ventilation in mine working, and at the same time one of the greatest obstacles for securing it, is the increase of heat as depth is obtained. This heat is usually due to one or a combination of the following causes: (1) The increasing secular heat as further approach is made toward the interior of the earth; (2) proximity of the workings to heated volcanic rocks, sulfataras, hot springs, etc.; (3) chemical decomposition of certain constituents of the ores, or of the enclosing wall-rocks, confined to deposits of comparatively rare occurrence; (4) animal heat and heat due to the use of illuminants and explosives, all of subordinate importance. It is generally estimated that the average increment of temperature due to internal heat of the earth is 1° F. for about 60 feet vertical depth. This rate of increase is by no means uniform in different localities, and is not invariably uniform in the same mine. Ventilation or the removal of this heated and sometimes noxious air is usually accomplished at the present time by exhaust-fans in the up-cast shaft supplemented by electrically driven fans underground, and by the exhaust of air-drills.

Treatment of the Ore.—The manipulation of the ore above ground, in so far as it is an engineering problem, consists of its crushing and its handling in the mills, and of its conveying and disposal before reaching and after leaving the mills. Modern advance in this department of mining engineering is along the line of employing heavier, stronger, more durable, more economical, and more efficient machinery, and more scientific methods. See IRON AND STEEL.

MINING ENGINEERS, AMERICAN INSTITUTE OF, organized in 1870, had in 1899 a membership of 2660. President, Dr. James Douglas; secretary, Dr. R. W. Raymond, 99 John Street, New York City.

MINNESOTA, a northwestern State of the United States, has an area of 83,365 square miles. The capital is St. Paul. Minnesota was admitted to the Union May 11, 1858.

Mineralogy.—With a total production during the calendar year 1898 of 5,963,509 long tons of iron ore, all of the red hematite variety, the State continued to hold second rank in both the general production and in that of its specialty. The ores came from the noted Vermilion and Mesabi ranges, both of which are wholly within the State, and of these the Mesabi range yielded 4,837,971 long tons, its greatest record, and the Vermilion range 1,125,538 tons, a decrease from its maximum of the previous year. The total of both ranges exceeded that of 1897 by 362,080 long tons, and was valued at \$4,659,649, and the shipments aggregated 5,878,908 tons. A Duluth report of December 15, 1899, placed the total shipments from Minnesota mines for that year at 8,364,294 long tons, or somewhat over 2,500,000 tons in excess of the 1898 shipments. Before the close of 1899 practically all the Lake Superior bessemer ore, the old-range ore, and the old-range non-bessemer ore, aggregating nearly 18,000,000 long tons, had been sold for delivery in 1900, a transaction the greatest by far in the history of the American iron trade. In order to handle the great shipments already under charter, all the railways concerned in the ore traffic have been obliged to increase their rolling-stock and dock facilities, and several have extended their lines. This condition also affected the lake-carrying interests similarly. Quarrying during 1898 yielded granite valued at \$79,309; sandstone, \$175,810; slate, \$400, and limestone, \$345,685—total, \$601,204.

Agriculture.—The following shows the production and value of the principal crops in the calendar year 1899: Corn, 31,171,272 bushels, value, \$7,481,105; wheat, 68,223,581, \$37,522,969; oats, 52,688,416, \$11,591,452; barley, 8,144,125, \$2,524,679; rye, 1,112,472, \$467,238; buckwheat, 193,562, \$100,652; potatoes, 10,888,608, \$2,722,152; and hay, 2,575,230 tons, \$11,202,250. Live stock comprised horses, 459,673, \$25,230,763; mules, 8248, \$489,858; milch cows, 672,540, \$21,285,891; other cattle, 504,463, \$13,700,354; and sheep, 419,218, \$1,333,113.

Manufactures.—During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$2,567,688. There were 105 manufacturers of tobacco and 567 of cigars, and the combined output was 49,817,119 cigars, 90,680 cigarettes, 200 pounds of fine-cut tobacco, 91,478 pounds of smoking, and 20,634 pounds of snuff. The amount of spirits rectified was 681,847 gallons; distilled spirits gauged, 1,303,573 gallons, and fermented liquors produced, 581,212 barrels. In December, 1899, it was estimated in Minneapolis that local mills would cut nearly 120,000,000 feet more lumber in the coming season than in any previous one, and Duluth records showed an output of that lumber district for the season of about 750,000,000 feet. At the beginning of the winter's logging there were 15,000 men and 5000 horses at work in the country around the head of Lake Superior and the Upper Mississippi River, and it was expected that 1,200,000,000 feet of standing lumber would be cut during the winter, for working up in Duluth, Superior, and Minneapolis. With all possible activity in lumbering and milling, the supply was far below the season's demands, and the industry was seriously hampered by inadequate shipping facilities. Heretofore, lumbering has been confined chiefly to pine, although the forests contain excellent pulp-wood, cedar, birch, and many valuable hardwoods for furniture-making. In 1899 a beginning was made in the use of spruce for pulp, and a number of paper-mills were under contract for erection. For the first time, also, there was a demand for cedar, especially for railway ties, and for birch timber for thread spools for export to England.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the Duluth and Minnesota districts aggregated in value \$2,569,524; exports, \$4,774,037, an increase in a year of \$13,407 in the former, and of \$780,812 in the latter.

Banks.—On October 31, 1899, there were 69 national banks in operation and 41 in liquidation. The active capital aggregated \$12,290,000; circulation, \$2,459,476; deposits, \$52,962,030, and reserve, \$19,154,616. The State banks, June 30, 1899, numbered 171, and had capital, \$6,716,800; deposits, \$25,531,604, and resources, \$36,893,839; loan and trust companies, 8, with capital, \$3,362,326; deposits, \$1,233,189, and resources, \$5,529,203; private banks, 47, with capital, \$639,275; deposits, \$2,940,070, and resources, \$3,900,631; and stock savings-banks, 10, with depositors, 46,000; deposits, \$10,864,228, and resources, \$11,960,785. The exchanges at the United States clearing house at Minneapolis in the year ending September 30, 1899, aggregated \$517,797,428, an increase of \$54,786,938 in a year.

Railways.—The new railway construction during 1898 was 262.35 miles, and during 1899, 368.84 miles, giving the State a total mileage of 6771.71. A considerable part of the construction in 1899 was on new link lines and on old line extensions, to keep up with the extraordinary development of iron-mining.

Education.—At the close of the school year 1897-98, the school population was 510,800; enrolment in the public schools, 384,063, and average daily attendance, 243,200. There were 11,243 teachers, 7600 buildings used as school-houses, and public school property valued at \$14,559,564. The revenue was \$5,084,765; expenditure, \$4,893,678, of which \$3,235,879 was for teachers' salaries. There were 112 public high schools, with 504 secondary teachers, 11,710 secondary students, and 1036 elementary pupils; 30 private secondary schools, with 177 secondary teachers, 1565 secondary students, and 2573 elementary pupils; 5 public normal schools, with 93 teachers and 3351 students in all departments, and 2 private ones, with 11 teachers and 194 students. Normal training was also given in 3 colleges and 9 public high schools. Nine colleges for men and for both sexes reported 2 fellowships, 12 scholarships, 381 professors and instructors, 4557 students, 92,000 volumes in the libraries, valued at \$119,241; \$132,900 invested in scientific apparatus, \$2,747,560 in grounds and buildings, and \$1,662,091 in productive funds; \$400,514 in total income, and \$36,421 in benefactions. Albert Lea College for women reported 7 professors and instructors, 47 students, 2000 volumes in the library, \$25,000 invested in grounds and buildings, and the same amount in productive funds; \$5970 in total income, and \$6000 in benefactions. In 1899 there were 648 periodicals, of which 36 were dailies, 521 weeklies, and 68 monthlies.

Finances.—The assessed valuations in 1898 were: Real estate, \$489,565,789; personal property, \$109,792,757—total, \$599,358,546, an increase in a year of \$28,759,433; total tax levied, \$13,847,896; State tax rate, \$1.80 per \$1000; special tax for public school and university purposes in addition, \$1.23. The total bonded debt, February 1, 1899, was \$1,349,000, of which \$418,000 was held in State funds; and certificates of indebtedness due between July 1, 1900, and July 1, 1908, amounted to \$500,000. The funding bonds, due July 1, 1921, are subject to call at any time, with a limit of \$150,000 yearly.

New Townships.—During the summer of 1899 surveys were made of fifty townships, comprising more than 1,110,000 acres, in the northwest corner of the State, that will be added to the public domain as soon as the surveys are examined and registered. About one-fifth of the land is valueless till drained; the remainder is well adapted to agriculture. Most of the tract formerly belonged to the Red Lake Chippewa Indians. The new Manitoba and Southeastern Railroad, which will reach Lake Superior at Crookston and Fort Williams, will render this tract accessible for immediate improvement.

Population.—As estimated by federal authorities, the population on June 30, 1899, was about 1,850,000.

Legislation.—Legislation in Minnesota during 1899 disclosed no enactments that seemed specially novel or important. An amendment to the constitution, providing for loaning the permanent school and university funds in the bonds of municipalities and school districts, will be voted upon by the people at the next general election. The raising of sugar beets is encouraged, and sugar-beet seed is to be distributed. The governor is to set apart a day for tree-planting, and measures have been taken for the protection of birds. Bicycle paths are protected, and those who throw on any highway that which will injure bicycles or puncture tires are guilty of a misdemeanor. Civil rights are protected by making it a misdemeanor to deprive any person of the full and equal enjoyment of the accommodation and privilege of all places of public resort, of amusement, or conveyances, because of race, creed, color, or previous condition of servitude. Husband and wife are not liable for each other's debts. A State dairy and food commissioner is to be appointed, with important duties devolving upon him. Milkmen in cities and towns must be licensed, and regulations were made for the management of dairies. It is a misdemeanor to sell "renovated or boiled butter" without stamping it. The use of chemicals to preserve butter, milk, or cheese is prohibited.

A law governing, with much detail, primary elections for the nomination of candidates, and another permitting the use of automatic voting machines were enacted. The preservation and growth of forests is encouraged, and a State board of forestry was created. A State board of nine citizens was created to constitute a tribunal of appeal from complaints of grain inspection; their decision as to grade of grain is final. The docking of horses was made a misdemeanor. Interest was reduced from 7 to 6 per cent. "Travelling libraries" were provided for, and a State library commission was created. A naval reserve, composed of eight companies, was established. Railroad commissioners, heretofore appointed by the governor, will hereafter be elected. All narrow-gauge railroads must be changed to standard-gauge. Rates on grain, flax, lumber, live stock, and coal in force for sixty days shall not be raised, except by authority of the railroad commission. Free transportation shall be given to shippers of live stock. A caboose with a toilet-room must be attached to all live stock and emigrant trains. Attendance at school was made compulsory, and a truant officer is to be appointed; uniform State cer-

tificates for teachers were provided for, and a State high school board was created to provide for higher education.

State Officers and National Representatives.—Governor, John Lind; lieutenant-governor, L. A. Smith; secretary of State, Albert Berg; treasurer, A. T. Koerner; auditor, R. C. Dunn; adjutant-general, G. C. Lambert; commissioner of insurance, J. A. O'Shaughnessy; attorney-general, W. B. Douglas. Supreme Court: Chief Justice, Charles M. Start; associate justices, Calvin L. Brown, John A. Lovely, Charles L. Lewis, L. W. Collins; clerk, Darius F. Reese. The State Legislature consists of 135 Republicans, 26 Democrats, 8 Fusionists, 9 Populists, and 2 Independents. Senators: Cushman K. Davis, from St. Paul, and Knute Nelson, from Alexandria, both Republicans. Representatives: James A. Tawney, from Winona; James T. McCleary, from Mankato; Joel P. Heatwole, from Northfield; F. C. Stevens, from St. Paul; Loren Fletcher, from Minneapolis; Page Morris, from Duluth; and Frank M. Eddy, from Glenwood—all Republicans.

MINNESOTA, UNIVERSITY OF, at Minneapolis, organized by the State in 1868, is co-educational and non-sectarian. In 1899 there were the following schools (the number of students in attendance being appended): The Graduate Department (147 men, 48 women—total, 195); the College of Science, Literature, and the Arts (418 men, 480 women—total, 898); the College of Engineering and the Mechanic Arts (136 men, 15 women—total, 151); the School of Mines (62 men); the School of Chemistry (9 men); the Department of Agriculture (349 men, 60 women); the College of Law (440 men, 7 women); the Department of Medicine (448 men, 27 women); and the Summer School (141 men, 239 women); total (excluding duplicates), 2099 men and 826 women; grand total, 2925. The university library contains about 50,000 volumes, and there are libraries accessible in St. Paul and Minneapolis, aggregating 252,000 volumes. President, Cyrus Northrop, LL.D.

MISSIONARY ASSOCIATION, AMERICAN, founded in 1846, a society of the Congregational denomination, has done work among the American Indians and the Chinese in America, and in 1899 sent eight teachers to Puerto Rico. The association publishes the *American Missionary*. The fifty-third annual meeting was held at Binghamton, N. Y., October 17-19, 1899. President, Rev. F. A. Noble, D.D.; corresponding secretaries, Rev. A. F. Beard, D.D., Rev. F. P. Woodbury, D.D., Rev. C. J. Ryder, D.D., Fourth Avenue and Twenty-second Street, New York City.

MISSIONS, CHRISTIAN FOREIGN. See FOREIGN MISSIONS.

MISSISSIPPI, a Gulf State of the United States, has an area of 46,810 square miles. The capital is Jackson. Mississippi was admitted to the Union, December 10, 1817.

Agriculture.—In the season of 1898-99 the cotton area was 2,900,298 acres; the yield, 1,247,128 gross bales, giving the State third rank in production; and the average price was 5.27 cents per pound for upland and 14 cents for sea island. For the season of 1899-1900 the official estimate was: Area, 2,784,000 acres; yield, 209 pounds of lint cotton per acre. Other productions and values in the calendar year 1899 were: Corn, 39,043,712 bushels, value, \$17,960,108; wheat, 25,010, \$19,508; oats, 1,365,740, \$682,870; potatoes, 324,032, \$330,513; and hay, 79,059 tons, \$731,296. Live stock, January 1, 1900, comprised horses, 203,492, \$8,903,707; mules, 164,713, \$9,743,925; milch cows, 244,103, \$5,052,932; other cattle, 273,706, \$3,719,121; and sheep, 215,748, \$335,490. See COTTON AND THE COTTON INDUSTRY.

Manufactures.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$90,842. Eight factories had a combined output of 227,322 cigars. Other taxable productions are included in the totals of Louisiana, with which Mississippi constitutes one district. In 1899 there were 10 cotton mills in operation, and at the close of the year 22 more were in course of organization. The increase in the number of spindles during the year was 5184. The new mills will represent an average capital of \$100,000 each; several exceeding that amount.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the port of Pearl River aggregated in value \$439; exports, \$1,704,939, a slight decrease in a year in imports and an increase of \$333,401 in exports.

Railways.—The new railway construction during the calendar year 1898 amounted to 41 miles, and during 1899 to 135.44 miles, giving the State a total mileage of 2826.82.

Banks.—On October 31, 1899, there were 12 national banks in operation and 5 in liquidation. The active capital aggregated \$955,000; circulation, \$305,710; deposits, \$2,722,820; and reserve, \$694,359. The State banks, June 30, 1899, numbered 92, and had capital, \$3,782,530; deposits, \$9,847,771; and resources, \$15,807,578.

Education.—At the close of the school year 1896-97, the last for which reports are available, the school population was 531,300; enrolment in the public schools, 367,579; and average daily attendance, 223,900. There were 7903 teachers, 6510 buildings used as

school-houses, and public school property valued at \$1,636,055. The revenue was \$1,214,630; expenditure, \$1,165,840, of which \$1,057,735 was for teachers' salaries. There were 85 public high schools, with 186 secondary teachers, 3472 secondary students, and 4667 elementary pupils; 50 private secondary schools, with 144 secondary teachers, 2415 secondary students, and 4398 elementary pupils; 7 public normal schools, with 31 teachers and 1110 students in all departments; and 10 private ones, with 70 teachers and 2052 students. Normal training was also given in 7 colleges and 29 public high schools. Four universities and colleges for men and for both sexes reported 4 fellowships, 10 scholarships, 52 professors and instructors, 769 students, 30,000 volumes in the libraries, valued at \$34,000; \$38,800 invested in scientific apparatus, \$440,000 in grounds and buildings, and \$692,500 in productive funds; \$67,243 in total income and \$7000 in benefactions. Thirteen colleges for women reported 149 professors and instructors, 1969 students, 11,300 volumes in the libraries, \$410,000 invested in grounds and buildings, and \$117,427 in total income. Two schools of technology had 35 professors and instructors, 544 students, 10,000 volumes in the libraries, \$97,250 invested in scientific apparatus, \$244,010 in grounds and buildings, and \$197,150 in productive funds, and \$120,760 in total income. In 1899 there were 226 periodicals, of which 14 were dailies, 172 weeklies, and 22 monthlies.

Finances.—The amount and disposition of the bonded debt in 1899 were the same as reported in the YEAR BOOK for 1898—namely, \$2,682,876, which included \$1,612,512 in school funds, the only debt on which interest has to be paid. The last reported assessed property valuations—those for 1897—were: Real estate, \$113,210,931; personal property, \$44,994,791; railroad, telegraph, and telephone property, \$24,682,876—total, \$182,888,598. The last reported tax rate (1897) was \$6.50 per \$1000.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 1,540,000.

Party Platforms.—The Republicans held no convention in 1899, but united with the Populists, at whose convention, held August 16, a platform was drawn up favoring direct legislation through the initiative and referendum; declaring that the only solution of the trust problem may be reached through the public ownership of public utilities; advocating the issuance and control of all the money of the country—gold, silver, and paper—by the government and the restoration of the silver coinage at the ratio of 16 to 1; denouncing the electoral system of Mississippi, and favoring an amendment to the State constitution providing that tax receipts shall be the test of electoral privileges; demanding the better collection of taxes and favoring their reduction by the abolition of useless offices and the curtailment of extravagant salaries, and favoring an amendment to the Constitution rendering all public officials and their deputies ineligible to succeed themselves or each other in office.

The Democrats in their State convention of August 16, 1899, enunciated a declaration of principles, which endorsed the Chicago platform of 1896 and the policies of Mr. W. J. Bryan; protested against trusts and combines, and endorsed the Democratic administration of public affairs in Mississippi and the system of primary elections, under proper restrictions, for all Democratic nominations. The platform itself was very short, but amendments of about double its length were offered, in which various acts of the State administration were noted and disapproved of; these, however, were rejected by majority votes.

Elections.—The Republican-Populist-Fusion candidate, Mr. Prewett, received 6097 votes; the Democratic candidate, Mr. A. H. Longino, received 42,273 votes, and hence was elected by a plurality of 36,176, the whole vote cast being 48,370.

State Officers and National Representatives.—Governor, A. H. Longino; lieutenant-governor, James T. Harrison; secretary of state, J. L. Power; treasurer, R. J. Stowers; auditor, W. Q. Cole; superintendent of education, H. L. Whitfield; attorney-general, Monroe McClurg; adjutant-general, William Henry. Supreme Court: Chief justice, Thomas H. Woods; associate justices, S. H. Terral, Albert H. Whitfield; clerk, Edward W. Brown. The State legislature consists wholly of Democrats (178), with the exception of two Populists in the lower House. Senators, H. de S. Money (Dem.), of Carrollton, and Will Van Amberg Sullivan (Dem.), appointed temporarily for the governor, *vice* E. C. Walthall, deceased. Representatives, John M. Allen, from Tupelo; Thomas Spight, from Ripley; T. C. Catchings, from Vicksburg; A. F. Fox, from West Point; John S. Williams, from Yazoo; Frank A. McLain, from Gloster; Patrick Henry, from Brandon—all Democrats.

MISSOURI, a central State of the Mississippi Valley, has an area of 69,415 square miles. Capital, Jefferson City. Missouri was admitted to the Union in 1821.

Mineralogy.—In 1899 State Geologist Gallagher predicted that within the next five years Missouri would startle the world with the great amount of lead, zinc, copper, nickel, cobalt, and coal mined in the State, and declared that in these minerals Missouri was the richest of any State in the country. The principal source of the supply

of zinc ore in the United States is the Joplin-Galena district in southwestern Missouri and southeastern Kansas. Formerly all the ore mined there was converted into metal on the spot, and the output could be ascertained readily, but now considerable quantities of concentrates are shipped to distant smelters, hence the local production can be approximated only. During 1898 the sales of zinc ore in the district amounted to 235,122 short tons, and of lead ore to 26,473 short tons, of a combined value of \$7,145,262. In zinc there was an increase in a year of 53,587 short tons, and in lead a decrease of about 3650 tons. State Mine Inspector Quimby, reporting for the fiscal year ending June 30, 1899, says that at least \$10,000,000 of Eastern and other out-of-State capital was invested in the lead and zinc mines of the State in the year, and that, as results, new mills were springing up on every hand, pumping systems were being brought to the highest state of efficiency, and valuable and abandoned properties were being reclaimed and successfully operated. The total value of lead and zinc mined in the State during the year was \$9,009,953, an increase of \$3,071,218 over the total of the previous year. At the close of 1899 it was estimated that the total for the entire district would exceed \$11,000,000 for the calendar year. The output of coal in the calendar year 1898 was the largest since 1893—namely, 2,688,321 short tons, from 124 mines, valued at \$2,871,296. In that year the demand for iron gave a value to the "lean ore" not previously reported, because considered unmarketable without further treatment. This ore with the year's mining gave a total output of 205,347 long tons, almost all of the red hematite species, valued at \$123,345. Quarrying yielded granite valued at \$78,423; sandstone, \$48,795; and limestone, \$735,275—total, \$862,493. See ASPHALTUM.

Agriculture.—An important enterprise was undertaken in 1899, under a recent act of the legislature, which will give the State many thousand acres of the richest possible farming land. The scheme is the draining of the swamps in Scott, Pemiscot, and New Madrid Counties, in the southwestern part of the State, by means of channels dredged through the swamps and forests so that the water can run off. It is expected that the land when drained and cleared of timber will be worth \$40 an acre. The following shows the production and value of the principal crops in the calendar year 1899: Corn, 162,915,064 bushels, value, \$48,874,519; wheat, 11,398,702, \$7,067,195; oats, 20,299,350, \$4,871,844; barley, 12,960, \$5443; rye, 127,439, \$63,720; buckwheat, 34,986, \$21,341; potatoes, 8,757,496, \$3,502,998; and hay, 3,094,394 tons, \$19,339,962. Live stock, January 1, 1900, comprised horses, 724,597, \$24,891,718; mules, 165,026, \$7,210,321; milch cows, 659,731, \$18,868,307; other cattle, 1,387,615, \$36,981,329; and sheep, 597,619, \$1,854,711. See AGRICULTURE (paragraph Agricultural Teaching).

Manufactures.—During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$16,369,075, the seventh largest among the States. There were 92 manufacturers of tobacco, and 980 of cigars, and the combined output in the calendar year 1898 was 67,295,824 cigars, 350,735,000 cigarettes, 59,933,571 pounds of plug tobacco, 53,637 pounds of fine cut, 5,021,108 pounds of smoking, and 20,016 pounds of snuff. Grain and fruit distilleries in operation numbered 67; the amount of spirits rectified was 2,912,834 gallons; distilled spirits gauged, 7,631,683 gallons; fermented liquors produced, 2,254,039 barrels; and oleomargarine produced, 1,867,211 pounds.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the delivery ports of Kansas City, St. Joseph, and St. Louis aggregated in value \$3,417,640, an increase in a year of \$454,351; exports, \$5486, making the total foreign trade of the year \$3,423,126.

Railways.—The new railway construction during the calendar year 1898 amounted to 132.40 miles, and during 1899 to 98.80 miles, giving the State a total mileage of 6909.45.

Banks.—On October 31, 1899, there were 63 national banks in operation and 66 in liquidation. The active capital aggregated \$17,615,000; circulation, \$20,157,709; deposits, \$107,023,249; and reserve, \$28,895,885. The State banks, April 5, 1899, numbered 495, and had capital, \$18,991,435; deposits, \$77,939,376; and resources, \$110,492,047; and the private banks, 88, with capital, \$933,370; deposits, \$6,106,178; and resources, \$8,165,038. The exchanges at the United States clearing houses at St. Louis, Kansas City, and St. Joseph, in the year ending September 30, 1899, aggregated \$2,381,129,030, an increase in a year of \$278,857,029.

Education.—At the close of the school year 1897-98, the school population was 981,422; enrolment in the public schools, 688,583; and average daily attendance, 440,692. There were 15,266 teachers, 10,116 buildings used as school-houses, and public school property valued at \$16,718,410. The revenue was \$6,489,476; expenditure, \$6,248,961, of which \$4,230,504 was for teachers' salaries. There were 201 public high schools, with 654 secondary teachers, 17,143 secondary students, and 2089 elementary pupils; 80 private secondary schools, with 344 secondary teachers, 4466 secondary students, and 3461 elementary pupils; 5 public normal schools, with 51 teachers and 2667 students in all departments, and 5 private ones, with 39 teachers and 1463 stu-

dents. Normal training was also given in 11 colleges and 15 public high schools. Twenty-six universities and colleges for men and for both sexes reported 7 fellowships, 174 scholarships, 516 professors and instructors, 6513 students, 195,495 volumes in the libraries, valued at \$378,425; \$319,105 invested in scientific apparatus, \$4,884,000 in grounds and buildings, and \$3,771,839 in productive funds, \$580,970 in total income, and \$360,207 in benefactions. Twelve colleges for women reported 179 professors and instructors, 1368 students, 13,800 volumes in the libraries, \$715,000 invested in grounds and buildings, and \$84,600 in productive funds, and \$157,579 in total income. In 1899 there were 1096 periodicals, of which 84 were dailies, 821 weeklies, and 146 monthlies.

Finances.—In 1898 the total assessed valuation was \$971,935,839, a decrease in a year of \$4,818,313, and the tax rate was \$2.50 per \$1000, the same as since 1892. The total bonded debt, January 1, 1899, was \$3,642,000; school and seminary certificates, \$4,393,839—total, \$8,035,839. In November, 1899, the State Fund Commissioners resolved to call in \$1,000,000 of State bonds and to extinguish the entire debt in 1901, and in December the State treasurer redeemed \$795,000 in 3 per cent. option bonds held in New York. The commissioners expected to redeem \$500,000 more in bonds in January, 1900, which would make a total reduction of the bonded debt in a year of nearly \$1,500,000.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 3,320,000.

Legislation.—Two constitutional amendments are to be submitted to the people in 1900: (1) to provide for authorizing a jury to return a verdict upon two-thirds of their number concurring therein; and (2) to authorize counties to levy a special tax of 15 cents on each \$100 of valuation for road and bridge purposes. A State poultry association was created, with the governor a member of the executive board; also the office of beer inspector and a State board to examine and license barbers. A manager, inspector, and board of trustees of a fruit experiment station are to be appointed by the governor. In view of the increasing number and influence of department stores, a law was enacted dividing articles of trade into a large number of classes and allowing the sale of goods of more than one class by the same business management only upon the payment of license fees. These fees were designed to be practically prohibitive of the business of the department store. The law applied only in cities of 50,000 or more inhabitants. It was regarded by many jurists to be unconstitutional. A free labor bureau must be established in every city having more than 100,000 inhabitants. When goods are made under unclean or unhealthful conditions, they must be labelled by the labor commissioner "Tenement-made," or "Made under unhealthful conditions," in letters two inches long, and it is unlawful to remove such tag. No one shall work in a bakery more than six days in one week, or if afflicted with consumption, scrofula, or skin disease, and no one shall sleep in the bake-room. Eight hours were made a day's work in all mines except coal mines. Miners shall be paid at least once in every fifteen days, and shall be given one hour above ground for each meal. All inheritances, except to direct heirs or persons dependent upon the testator, shall be taxed 5 per cent. In the matter of trust legislation Missouri has distanced all the other States. More laws concerning trusts and trade combinations have been passed and more cases have reached its higher courts than in any other State, and the efforts to enforce these laws have created widespread interest. The last legislature did its part toward strengthening the anti-trust statutes already in force. Among the multitude of cases that might be cited is the following: In July, 1897, the attorney-general brought suit against seventy-three foreign insurance companies doing business in St. Joseph, charging them with violating the provisions of the anti-trust law by combining to maintain rates for fire, tornado, and lightning insurance in said city. The case was finally settled by inflicting a penalty of \$1000 upon each company, and allowing them to do business without combination as to rates. It is said that the attorney-general has commenced suit of a similar character against about eighty other foreign insurance companies.

State Officers and National Representatives.—Governor, Lon V. Stephens; lieutenant-governor, A. H. Bolte; secretary of state, A. A. Lesueur; treasurer, F. L. Pitts; auditor, J. M. Seibert; adjutant-general, M. Fred Bell; attorney-general, E. C. Crow; superintendent of education, W. T. Carrington; railroad and warehouse commissioners, J. Flory, T. J. Hennessey, and W. E. McCully; secretary State Board of Agriculture, J. R. Rippey; superintendent of insurance, E. T. Orear. Supreme Court: Chief justice, James B. Gantt; associate justices, Thomas A. Sherwood, Gavon D. Burgess, Theodore Brace, L. B. Valliant, W. C. Marshall, Waltour M. Robinson; clerk, J. R. Green. The State legislature consists of 105 Democrats, 67 Republicans, and 2 Populists. Senators: Francis M. Cockrell, from Warrensburg, and George G. Vest, from Kansas City—both Democrats. Representatives: James T. Lloyd (Dem.), from Shelbyville; W. W. Rucker (Dem.), from Keytesville; John T. Dougherty (Dem.), from Liberty; Charles F. Cochran (Dem.), from

St. Joseph; William S. Cowherd (Dem.), from Kansas City; David A. DeArmond (Dem.), from Butler; James Cooney (Dem.), from Marshall; D. W. Shackelford (Dem.), from Jefferson City (*vice* Richard P. Bland, who died June 15, 1899); Champ Clark (Dem.), from Bowling Green; Richard Bartholdt (Rep.), from St. Louis; Charles F. Joy (Rep.), from St. Louis; Charles E. Pearce (Rep.), from St. Louis; Edward Robb (Dem.), from Perryville; W. D. Vandiver (Dem.), from Cape Girardeau; M. E. Benton (Dem.), from Neosho.

MITCHELL, PETER, one of the promoters of Canadian federation, the first cabinet of which entered into office in 1867, died at Montreal, November 26, 1899. He was born in 1824 at Newcastle, New Brunswick. In 1856 he was elected to the legislature for the county of Northumberland. He became legislative councillor, and in 1858 entered the government of Sir Leonard Tilley. At the time of his death he was inspector of fisheries, a post he had held since Sir Wilfrid Laurier had assumed power. He was president of the Mitchell Steamship Company, and largely interested in the Canadian Pacific Railway. He was proprietor of the *Montreal Herald*, and later president of the Herald Publishing Company.

MONAZITE. The production in 1898 was 250,776 pounds, valued at \$13,542. That for 1899 will probably be about the same. North Carolina continues to be the native source of supply.

MONEY. The table on the following page, compiled by the United States director of the mint, shows the stock of gold, silver, and uncovered paper in the countries of the world on January 1, 1899, together with estimates of population. When compared with the statement for the year ending June 30, 1898, there is an apparent increase in the world's stock of gold about \$19,700,000, a decrease in silver of \$141,700,000, and an increase of uncovered paper of about \$524,000,000.

MONIER-WILLIAMS, Sir MONIER, D.C.L., LL.D., PH.D., professor of Sanskrit in the University of Oxford, died April 11, 1899. His high place in Oriental scholarship was widely recognized. He was born in Bombay, November 12, 1819; he studied at King's College, London, and entered Balliol College, Oxford, in 1838. Before taking his degree he left Oxford and studied at the East India College, Haileybury; he re-entered Oxford and received his degree (M.A.) from University College, 1844. From this time to 1858 he occupied the chair of Sanskrit at Haileybury, and for the next two years at Cheltenham. In 1860 he was appointed to the chair of Sanskrit at Oxford, in which position he remained to the time of his death. He was the founder of the Indian Institute at Oxford; in 1875 he proposed the founding of this institution, and subsequently made three Indian journeys in support of it—the first in 1875-76, the second in 1876-77, and the third in 1883-84. He superintended the completion of the institute in 1896. In 1880 he was made a C.I.E., and a K.C.I.E. in 1886. Among his many publications are: *Sanskrit Grammar*, 1846; *English-Sanskrit Dictionary*, 1851; *Introduction to Hindustani*, 1858; *Application of the Roman Alphabet to the Languages of India*, 1859; *Study of Sanskrit in Relation to Missionary Work*, 1861; *Indian Epic Poetry*, 1863; *Practical Hindustani Grammar*, 1864; *Sanskrit English Dictionary*, 1872; *Practical Sanskrit Grammar*, 1876; *Hinduism*, 1877; *Modern India and Indians*, 1878; *Religious Thought and Life in India*, 1883; *Holy Bible and Sacred Books of the East*, 1886; *Buddhism*, 1890; *Brahmanism*, 1891; *Indian Wisdom*, 1893; *Reminiscences of Old Haileybury College*, 1894; *New Sanskrit-English Dictionary*, 1899.

MONROE, Rt. Hon. JOHN, LL.D., judge in the chancery division of the High Court of Justice in Ireland, died September 29, 1899. He was born in 1839; was admitted to the Irish bar in 1863, becoming a Queen's counsel in 1877. In 1885 he was made a judge of the Irish High Court, which position he held until he died. He was solicitor-general for Ireland in 1888.

MONTANA, a northwestern State of the United States, has an area of 146,080 square miles. The capital is Helena. Montana was admitted to the Union November 8, 1889.

Mineralogy.—The most noticeable feature of the report of Eugene B. Braden of the United States assay office, at Helena, on the mineral productions in the calendar year 1898, is the evidence that the great copper mining promise of 1897 was not maintained, the output in 1898 being the smallest since 1895. The report shows the following productions: Gold, 253,867 fine ounces, valued at \$5,247,912; silver, 14,818,661 fine ounces, of a coining value of \$19,159,482; copper, 216,979,354 fine pounds, valued at \$26,102,616, and lead, 21,403,592 fine pounds, valued at \$89,055. The output of gold showed an increase in a year of \$751,481, silver a decrease of \$2,571,227, copper a decrease of \$696,298, and lead a decrease of \$119,563. The decrease in copper was attributable to the closing down of the great Anaconda mine during a part of the year in consequence of a fire. After ten years of uninterrupted increase in the annual output of coal, the production in 1898, 1,479,803 short tons,

THE WORLD'S STOCK OF MONEY.

Countries.	Population.	Stock of Gold.	Stock of Silver.			Uncovered paper.	Per capita.			
			Full tender.	Limited tender.	Total.		Gold.	Silver.	Paper.	Total.
United States.....	75,300,000	\$945,800,000	\$583,700,000	\$75,800,000	\$659,500,000	\$380,700,000	\$12.56	\$8.48	\$4.38	\$25.42
United Kingdom.....	40,200,000	462,300,000	366,100,000	111,900,000	478,000,000	111,600,000	11.50	2.78	2.77	17.05
France.....	38,500,000	810,600,000	366,100,000	54,000,000	420,100,000	161,100,000	21.05	10.92	4.18	36.15
Germany.....	53,300,000	672,800,000	487,700,000	119,500,000	607,200,000	258,700,000	12.86	8.98	3.00	24.84
Belgium.....	6,600,000	90,000,000	40,000,000	5,000,000	45,000,000	82,500,000	4.54	6.83	12.50	23.86
Italy.....	31,700,000	98,000,000	16,000,000	27,900,000	43,900,000	174,900,000	8.09	1.88	5.52	15.49
Switzerland.....	3,100,000	24,000,000	500,000	10,700,000	11,200,000	17,400,000	7.74	8.45	5.61	19.80
Greece.....	2,400,000	53,400,000	.....	1,000,000	1,500,000	23,100,000	21	6.2	12.12	18.32
Spain.....	18,300,000	5,800,000	.....	37,800,000	37,800,000	187,500,000	2.92	2.06	10.84	15.22
Portugal.....	5,100,000	18,100,000	.....	9,600,000	9,600,000	76,300,000	1.02	1.88	14.74	17.64
Roumania.....	3,400,000	1,000,000	.....	7,100,000	7,100,000	20,200,000	2.43	1.81	7.48	9.79
Serbia.....	2,400,000	1,000,000	.....	1,800,000	1,800,000	3,600,000	4.1	1.75	1.50	7.35
Austria-Hungary.....	45,900,000	221,400,000	50,000,000	97,300,000	147,300,000	108,000,000	4.82	8.21	2.34	15.37
Netherlands.....	5,000,000	30,800,000	52,900,000	3,500,000	56,400,000	47,200,000	6.04	11.28	9.44	26.76
Norway.....	2,100,000	8,600,000	.....	2,800,000	2,300,000	5,100,000	4.10	1.09	2.43	7.62
Sweden.....	5,000,000	13,000,000	.....	6,500,000	6,500,000	29,500,000	2.60	1.30	5.90	9.80
Denmark.....	2,300,000	16,900,000	.....	5,400,000	5,400,000	5,900,000	7.35	2.35	2.56	12.26
Russia.....	130,000,000	740,400,000	80,000,000	81,900,000	81,900,000	.....	5.69	1.63	.....	6.82
Turkey.....	24,100,000	50,000,000	.....	10,000,000	40,000,000	.....	2.07	1.66	.....	3.73
Australasia.....	5,100,000	132,100,000	.....	7,000,000	7,000,000	29,500,000	25.90	1.37	4.41	31.68
Egypt.....	9,800,000	8,600,000	.....	6,400,000	6,400,000	.....	3.06	8.65	.....	11.71
Mexico.....	13,000,000	1,000,000	106,000,000	.....	106,000,000	4,000,000	6.6	8.15	.81	13.12
Central American States.....	3,400,000	1,000,000	11,400,000	.....	11,400,000	18,100,000	3.0	3.35	5.32	8.67
South American States.....	98,000,000	72,700,000	19,000,000	10,000,000	29,000,000	1,138,300,000	1.91	1.76	30.51	33.18
Japan.....	45,000,000	54,000,000	.....	23,300,000	23,300,000	.....	1.20	1.55	.....	1.75
India.....	389,900,000	.....	568,400,000	.....	568,400,000	47,400,000	.....	1.91	.16	2.07
China.....	389,500,000	.....	750,000,000	.....	750,000,000	.....	.....	1.96	.....	1.96
Straits Settlements.....	4,500,000	.....	940,000,000	.....	942,000,000	.....	.....	53.82	.....	53.82
Canada.....	5,400,000	20,000,000	.....	5,000,000	5,000,000	40,500,000	8.70	9.93	7.50	26.13
Cuba.....	1,800,000	2,000,000	.....	1,500,000	1,500,000	.....	1.11	8.3	.....	12.13
Haiti.....	1,000,000	1,200,000	.....	1,500,000	1,500,000	3,700,000	1.20	3.50	3.70	8.40
Bulgaria.....	3,800,000	1,000,000	.....	3,400,000	3,500,000	.....	3.80	2.06	.....	5.86
Siam.....	5,000,000	90,000,000	183,400,000	.....	193,400,000	.....	4.00	38.68	.....	42.68
Hawaii.....	100,000	4,000,000	1,000,000	.....	1,000,000	.....	40.00	10.00	.....	50.00
Cape Colony.....	2,100,000	27,600,000	.....	1,000,000	1,000,000	.....	17.86	4.7	.....	22.56
South African Republic.....	1,100,000	39,200,000	.....	1,300,000	1,300,000	.....	36.54	1.19	.....	37.73
Finland.....	2,600,000	4,100,000	.....	800,000	500,000	10,800,000	1.58	1.19	4.15	6.92
Total.....	1,317,300,000	\$4,614,600,000	\$3,102,500,000	\$733,300,000	\$3,835,800,000	\$2,846,600,000	\$3.50	\$2.91	\$2.16	\$8.57

valued at \$2,324,207, showed a decline in a year of 168,079 tons, the bulk of which was in Cascade County, although two-thirds of the entire product was from mines there. Quarrying yielded sandstone and limestone of a total value of \$66,879. General mining operations in 1899 showed a considerable betterment, especially in coal. A copper discovery of considerable magnitude was made on the East Boulder River in Jefferson County. Coal was found on the south fork of Sixteen-Mile Creek, which promised to surpass any existing coal field in the State; an important strike was made on the Mountain Side coal property in Gallatin County, disclosing a finer vein than any in the Bozeman district; a large plant was opened up at Bridger, in Carbon County, to work a newly discovered bituminous vein; and a fine vein, six feet wide, was discovered on Strickland Creek, near Livingston. Arrangements were concluded for an active working of the sapphire fields in Yogo now belonging to a syndicate, a market for these stones having been established in London, Paris, Berlin, and New York. The estimates of the United States director of the mint on the gold and silver production of the year credited Montana with gold, \$4,919,897, and silver, \$20,040,403.

Agriculture.—An important addition to the farming and grazing areas of the State was made possible in August, 1899, when the Crow Indians and government commissioners effected an agreement for the sale by the former to the government of 1,000,000 acres of land on the northern side of the Crow Reservation, from Fort Custer to the Yellowstone River, and from Prior Creek to the eastern boundary of the reserve, embracing the lower Big Horn and other smaller streams. A considerable part of this tract is arable, most of it is excellent for grazing, and parts are well timbered. The Northern Pacific Railway runs along the northern border, and the Burlington system passes diagonally through it. The price is about \$1 per acre. On the ratification of the agreement by Congress, the tract will be thrown open to settlement.

Railways.—The new railway construction during the calendar year 1898 amounted to 49.15 miles, and during 1899 to 24 miles, giving the State a total mileage of 2995.06.

Banks.—On October 31, 1899, there were 21 national banks in operation, and 23 in liquidation. The active capital aggregated \$2,305,000; circulation, \$727,711; deposits, \$12,645,199, and reserve, \$5,162,436. The State banks, June 30, 1899, numbered 14, and had capital, \$771,000; deposits, \$3,460,173, and resources, \$6,605,863.

Education.—At the close of the school year 1897-98, the school population was 49,498; enrolment in the public schools, 35,070, and average daily attendance, 23,400. There were 1086 teachers, 656 buildings used as school-houses, and public school property valued at \$1,857,964. The revenue was \$815,341; expenditure, \$776,150, of which \$483,221 was for teachers' salaries. There were 15 public high schools, with 39 secondary teachers, 896 secondary students, and 22 elementary pupils; 4 private secondary schools, with 14 teachers, 124 secondary students, and 526 elementary pupils; and a public normal school, with 5 teachers and 45 students in all departments. Normal training was also given in 1 college and 1 public high school. Three universities and colleges for men and for both sexes reported 1 fellowship, 1 scholarship, 31 professors and instructors, 253 students, 6700 volumes in the libraries, \$8800 invested in scientific apparatus, and \$225,000 in grounds and buildings, \$41,500 in total income, and \$2000 in benefactions. The State College of Agriculture and Mechanic Arts had 19 professors and instructors, 201 students, \$10,000 invested in scientific apparatus, and \$120,000 in grounds and buildings, and \$52,010 in total income. In 1899 there were 92 periodicals, of which 12 were dailies, 69 weeklies, and 7 monthlies.

Finances.—The assessed valuations in 1899 (full cash value) were: Real estate, \$72,482,529; personal property, \$54,288,096; railroad property, \$14,992,689—total, \$141,763,314; State tax rate, \$2.50 per \$1000. Loans issued on land-grants for the benefit of the State capitol, agricultural college, normal school, university, and deaf and dumb asylum, aggregated \$640,000. The State is not liable for these loans, and has no bonded indebtedness.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 240,000.

Proceedings of the Legislature.—The election of a United States senator required seventeen days of the legislative session, but on the eighteenth ballot William A. Clark (*q. v.*), Democrat, was elected to succeed Lee Mantle, Silver Republican. Charges of bribery were made, an investigation was demanded, and personal and political feeling ran high, so much so that ex-Speaker Kennedy was knocked down because of some remarks concerning bribery charges. Little important legislation seems to have been enacted during the remainder of the session. The office of court reporter was abolished in the Supreme Court, the judges thereof being required to report their own decisions, for which extra compensation is to be paid. Insurance companies are to be taxed to raise a fund for the aid of disabled firemen in cities, who are to hold their positions during good behavior. Free county high schools

and kindergartens were established. Stealing a ride upon a railroad was made a misdemeanor. A State board of horticulture was created with extraordinary powers for the inspection of trees and nursery stock, and with power to condemn and destroy that which is infected or diseased beyond cure. Every foreign insurance company issuing a policy in the State must have it countersigned by a resident agent in order that the State may collect the tax imposed on premiums.

State Officers and National Representatives.—Governor, Robert B. Smith; lieutenant-governor, A. E. Spriggs; secretary of state, T. S. Hogan; treasurer, T. E. Collins; auditor and insurance commissioner, T. W. Poindexter; attorney-general, C. B. Nolan; adjutant-general, F. C. English; superintendent of education, E. A. Carleton; commissioner of agriculture, J. H. Calderhead. Supreme Court: Chief justice, Theodore Brantley; associate justices, W. H. Hunt, W. T. Piggott; clerk, Henry G. Rickerts. The State legislature consists of 16 Republicans, 51 Democrats, and 24 Populists. Senators: Thomas H. Carter (Rep.), from Helena, and William A. Clark (Dem.), from Butte. Representative, A. J. Campbell (Dem.), from Butte.

MONTENEGRO, a small principality of southern Europe which for 400 years maintained its independence against Turkey, and whose independence was formally recognized by European powers in 1878, through the treaty of Berlin. The country is situated between Bosnia and Albania, and was till 1878 separated from the Adriatic by a strip of foreign territory. By the Berlin conference it was assigned the port and district of Antivari, and in 1880, through the influence of the powers, it obtained from Turkey the port and district of Dulcigno. The area is about 3630 square miles, and the population has been estimated at about 228,000, which may have decreased in recent years on account of emigration. Its capital is Cetigne, or Cetinje, with a population variously estimated at from 1500 to 3000. Other towns are Podgoritz, with 6000 inhabitants; Dulcigno, with 5000, and Niksik, with 3000. The majority of the inhabitants belong to the Greek Orthodox Church, and are allied to the Servian branch of the Slav race. Agriculture, the chief occupation, is carried on under somewhat primitive conditions. A species of common ownership prevails in most parts of the country. The crops include maize, oats, tobacco, potatoes, barley, buckwheat, the grape, and olives. The forests are abundant throughout the mountains, which traverse the country, the more valuable trees being the beech and the oak. Owing to the rocky and mountainous character of the land as a whole, farming is pastoral rather than agricultural, and large herds of cattle are reared. The trade is small. The executive authority is vested in the reigning prince, Nicholas I. The constitution, though nominally that of a limited monarchy, rests on a patriarchal basis. There is a legislative council of 8 members, one-half of whom are nominated by the Prince and one-half chosen by that part of the population capable of bearing arms. There is no standing army, though there are a few small military divisions, but all Montenegrins are trained soldiers, and an efficient army can be gathered if necessary. Montenegro also has no navy, but her ports, by international agreement of the powers, are closed to all foreign war-ships, and the protection of her coast-line is assumed by the national parties to the treaty of Berlin. In 1898 there were serious disturbances on the Montenegrin-Albanian border, growing out of the long-existing racial antagonisms of the Mohammedans and the Christians in the Berane district. Attention was also drawn to Montenegro in 1898 by the agitation in that country for the creation of a new state, to consist of Montenegro, Servia, Bosnia, and Herzegovina, and to be ruled by Prince Nicholas of Montenegro. In 1899 the Crown Prince Danilo was married to the Duchess Jutta, daughter of the Hereditary Grand Duke of Mecklenburg-Strelitz. In 1898 the revenue was said to be about \$340,640 (£70,000), and the public debt about \$827,240 (£170,000).

MONTSERRAT, a West Indian island, forming a presidency of the British crown colony of the Leeward Islands (*q. v.*), has an area of 32 square miles, and a population (1891) of 11,762. The chief town is Plymouth (population about 1500). The leading products are sugar, limes, coffee, and cacao. The sugar export in 1897 amounted to £5087; the annual export of lime-juice is about 100,000 gallons, valued at over £7400. The aggregate entrances and clearances in foreign shipping in 1897 were 228,715 tons. The following figures are for 1898: Imports, £15,161; exports, £13,849; revenue, £6199; expenditure, £11,935; public debt, £17,300. In the early part of the year, on account of certain excise collections, riotous outbreaks occurred, which were terminated by the arrival of the British cruiser *Talbot*. On May 17, 1899, Montserrat suffered within a period of five hours forty-five earthquake shocks, which did much damage. In the great hurricane of August 7 and 8, 1899, the island was devastated and three-fourths of the inhabitants were forced to depend on the government for food.

MOODY, DWIGHT LYMAN, evangelist, born February 5, 1837, at East Northfield, Mass., died at East Northfield on December 22, 1899. It is generally recognized that Mr. Moody was one of the great Christian teachers of recent years. His life-work was taken up soon after his conversion to the church, which occurred in Boston when he was at the age of eighteen. He was at that time a salesman in the shoe trade, and in 1856 he went to Chicago, where he followed the same business. He joined the Plymouth Congregational Church of Chicago and began his Christian work there by organizing a class of boys taken from the tenement district of Chicago. He next started a mission school, which was very successful, and finally comprised 650 pupils and 60 teachers. In 1860 Moody gave up business and engaged entirely in Christian work. In 1862 he married Emma C. Revell, a sister of Fleming H. Revell, the publisher. In 1865 he was elected president of the Chicago Y. M. C. A. For the next six years he travelled in the interest of Sunday-school and Y. M. C. A. work. Mr. Moody was instrumental in causing the erection of some of Chicago's best-known religious structures. After the great fire in 1871 he erected on the site of his burned mission chapel a building costing \$70,000. He built, also, Farwell Hall, the first Y. M. C. A. building in this country. He caused it to be rebuilt after a fire which destroyed the first structure, and again after the great fire of 1871, and finally he built the present well-known Farwell Hall. He also built the Chicago Avenue Church and the Bible and Institute Buildings, Chicago. Y. M. C. A. buildings at New York, Boston, Philadelphia, Baltimore, Scranton, and other cities were erected largely through his influence, while in England and Scotland, where he first became really famous, a number of well-known Y. M. C. A. and other buildings had been erected through his personal efforts. The establishment of the school for Christian workers, the Northfield Seminary for Girls, and the Mount Hermon School for Boys, comprising many buildings, attracted hundreds of students annually, besides making the name of Northfield a familiar one in all parts of the United States and Great Britain. During the Civil War Mr. Moody was in the service of the Christian commission, and in 1898, during the Spanish war, he was actively engaged in Christian work among the troops in the South. His evangelistic work became widely famous when he visited Great Britain with his co-worker, Ira D. Sankey, in 1873. The meetings which have been held by him throughout this country have been extraordinary for their number and great attendance, and especially for their wide influence. The character and life-work of Moody were equally unique. Personally he was a man of strong physical constitution and even temperament, with no academic culture, but with the power of inspiring nearly all with whom he came in contact. His theology was that of the orthodox church of the early middle century. At the same time he showed both toleration and breadth. There was no denominationalism in his expressed views, his meetings were always on a union basis, and he accepted the co-operation even of men whose broader views he could not accept, such as Drummond, George Adam Smith, and Beecher. He was a theologian in no sense. His theme was the love of God, and his story was told in the plainest of English; his work as he saw it was to inspire men with faith and love. It has been pointed out by Dr. Lyman Abbott that "though his view of the Bible belonged to the past cycles of thought, his use of the Bible was essentially modern," and that no man of recent times did more to promote a careful study of the Bible, a study which if not always scholarly, was always intelligent and spiritual.

MORAVIAN CHURCH. During 1899 the most important event in this church was the assembling of the General Synod in the mother church at Herrnhut, Saxony. The congregations of the Moravian missions in Greenland were in 1899 placed under the charge of the Danish Lutheran Church of Greenland. The number of Moravians in the United States was 14,521, with 117 ministers and 109 churches. The total number of Moravians in 1899 in America, England, and Germany was about 200,000.

MORMONS, OR LATTER-DAY SAINTS. The Church of Jesus Christ of Latter-Day Saints founded by Joseph Smith in 1830, finally settling on the Great Salt Lake in 1847. In 1899 this body had 1700 elders and 300,000 church members. The sect is carrying on active missionary work in many parts of the world.

The Reorganized Church of Jesus Christ of Latter-Day Saints was formed in 1851 by the secession of some of the original founders of Mormonism under the leadership of Joseph Smith, son of the prophet. Its headquarters are at Lamoni, Ia. In 1898 it had 2200 ministers and 40,639 members.

MORMONISM. Interest in the subject of Mormonism was augmented in 1899 by the case of the polygamist, Mr. Brigham H. Roberts, the representative-elect from Utah to the Fifty-sixth Congress. Shortly after Mr. Roberts's election in 1898 a movement to insure his exclusion from the House of Representatives was begun, and before the meeting of the Fifty-sixth Congress it had assumed considerable importance. Especial activity was shown in it by the Woman's Board of Home Mis-

sions of the Presbyterian Church. The objection against the seating of Mr. Roberts was part of a wider movement against the spread of Mormonism. Alarm was felt in certain quarters on account of the growing strength of the Mormons, who were said already to have gained a great influence in the States adjoining Utah. When Utah was admitted as a State in 1896 a clause forbidding polygamy was expressly set forth in its constitution. But in 1898 and 1899 it was charged that in spite of the promises that had been made before 1896, and in spite of the prohibitory clause of the constitution, the Mormons of Utah were still contracting polygamous marriages, and were only waiting until they should be strong enough before practising polygamy upon the large scale of former years. The Mormons retorted that no polygamous marriages had been contracted since 1890, and near the beginning of 1899 Lorenzo Snow, president of the Mormon Church, uttered a pronouncement in which he asserted "unequivocally and without any mental reservation" that after the manifesto abolishing polygamy in the Mormon Church had taken effect in 1890, which manifesto was issued by Wilford Woodruff, the late president, on April 6 of that year, no polygamous marriages had occurred in Utah. He also declared that no such marriages could take place without ecclesiastical sanction, that there was no movement in the church for the revival of polygamy, and that he and the other leaders in the church were opposed to any such revival. President Snow, however, maintained the right of those who had taken plural wives before 1890 to continue their marital relations, and implied that these relations on the part of Mr. Roberts should be no obstacle to the latter's admission to Congress. Mormonism, declared President Snow, "does not mean polygamy." On the other hand the opponents of Mormonism declared that the doctrine of polygamy is an essential part of Mormonism, and they asserted that the manifesto of 1890 was merely a suspension of the practice of polygamy for the time being. They further alleged that polygamous marriages were taking place secretly, and in formidable numbers. In December, 1899, a delegation to Congress, representing the Gentile element in Utah, issued a statement that there were two thousand polygamous households in Utah, that plural wives are supported by prominent Mormon politicians and ecclesiastics, and that one thousand illegitimate children had been born to polygamous wives since the admission of Utah to the Union. It will be remembered that President Harrison issued a proclamation of amnesty in January, 1893, to all persons liable to the penalties imposed for plural marriages who had abstained from unlawful cohabitation since November 1, 1890, and that President Cleveland had issued a similar proclamation in 1894 on the ground that he had evidence that the members of the church were actually practising such abstention. In regard to Mr. Roberts it was said that he had been convicted of living with plural wives before the amnesty proclamations of Presidents Harrison and Cleveland, and that he had not complied with the conditions of either of these proclamations. His conduct was moreover violative of the promise of the leaders of the Mormon Church in 1890, that all polygamous relations should cease, and that no new polygamous marriages should be consummated. He had urged the State to repudiate the promise which it had made as a Territory in order to secure statehood, and in this he was supported by the Mormon Church. The reason offered for such a course was that Utah was entitled of right to admission to the Union, without making such a covenant, and that the United States had no right to insist upon this covenant as a condition precedent to admission. It was thus obtained under duress, and was not morally obligatory. It was urged that by the election of Mr. B. H. Roberts Utah was virtually notifying the nation that she repudiated the solemn covenant which she made in order to secure statehood. In the petition which was sent to Congress urging the members to refuse Mr. Roberts his seat, it was advocated that an amendment to the constitution should be framed and submitted, making the election of polygamists henceforth impossible. Interest in the specific case of Mr. Roberts increased as the time for the convening of the Fifty-sixth Congress drew near, and widespread public opinion, as reflected in the press, was fairly well agreed against Mr. Roberts having a place in the House. Opinions differed, however, as to whether the House should refuse to admit him, or should first seat and then expel him. The majority of the people took the former view, and numerous protests against Mr. Roberts were made by churches, ecclesiastical bodies, and other organizations, representatives in Congress were appealed to by their constituents, and an immense popular petition was submitted to the House.

The pertinent arguments concerning the Roberts case involved two questions: (1) Had the House of Representatives constitutional authority to exclude Mr. Roberts? and (2) if it had, were the reasons for his exclusion sufficient? 1. Bearing directly upon the case the Constitution makes two declarations: First, that "each House shall be the judge of the elections, returns, and qualifications of its own members;" and secondly, that "no person shall be a representative who shall not have attained to the age of twenty-five years, and been seven years a citizen of the United States, and who shall not, when elected, be an inhabitant of that State in

which he shall be chosen." There was no doubt that Mr. Roberts possessed all the qualifications made in the second clause, with the exception of that of citizenship. This was a matter that elicited much discussion and is considered below. On the assumption, then, that he did possess all the qualifications named in the Constitution, had the House the power to refuse him his seat? On the one hand it was argued that not only no person without these could be admitted to the House, but that no person, even though possessing them, could be seated if the House, for reasons which it alone should decide to be sufficient, should vote to exclude him. The supporters of this constitutional interpretation based their judgment not only on what they held to be the plain meaning of the Constitution, but on the theory that the Constitution, being largely derived from the unwritten constitution of England, carries with it, in this matter of the rights of a parliamentary body to be the judge of its own members, the principles that have long obtained in Great Britain. On the other hand it was held that the Constitution permits the House of Representatives to decide only upon the questions of fact involved in the three qualifications explicitly set forth.

2. Those who believed that the House had constitutional authority to exclude Mr. Roberts held that the following was sufficient cause for exclusion; while those who believed that the House should first seat and then expel him held that the same reasons were adequate cause for expulsion. A federal law of 1862 prohibiting bigamy was amended in 1882, so that both the contracting of a polygamous marriage and the maintaining of marital relations with more than one woman was a felony and disqualified the offender from voting and holding office. This law, of course, applies only to Territories, and in the case of Utah became inoperative when that Territory was admitted to the Union in 1896. While the law was in force, however, Mr. Roberts contracted plural marriages, and for this felony was convicted in 1889 and served a term in prison. But thereafter and up to the present time he has not only supported his three wives, but continued his marital relations with them, and hence the proclamations of amnesty issued in 1893 and 1894 by President Harrison and President Cleveland were not applicable to him. On the ground of his being a convicted felon, who though having suffered the legal penalty had continued his criminal relations and had not received executive pardon, it was argued that he had lost his citizenship, and hence, according to the Constitution, was ineligible to office; while on the ground of the immorality of his continued polygamous relations it was argued that he was not a fit person to sit in the House of Representatives, and should therefore either not be admitted or be admitted and then expelled.

Those who maintained Mr. Roberts's citizenship said that by his conviction for crime he had not forfeited this, since the conviction had taken place prior to the admission of Utah as a State. In regard to his exclusion, rather than an admission to be followed by expulsion, aside from the constitutional objection held by some and mentioned above, it was argued that such exclusion would establish a mischievous precedent. By such a procedure "a formidable minority in the House," said Mr. Roberts, "may be reduced either to a very insignificant minority, or even blotted out of existence; the representation to which a State is entitled on the floor of the House may be denied to it." See ROBERTS, BRIGHAM HENRY.

MOROCCO, an African sultanate, lies between the Atlantic Ocean and the Mediterranean Sea on the north and the Desert of Sahara on the south, and Algeria on the east and the Atlantic on the west. The capitals are Fez, Morocco City, and Mequinez.

Area and Population.—As the southern frontiers are undetermined, the area cannot be stated with any degree of certainty; the most recent estimate places it at 219,000 square miles. Knowledge of the population is also very vague, but 5,000,000 is an estimate accepted by some authorities; other estimates range from 2,500,000 to 9,400,000. On the basis of the latter figure races are represented as follows: Berbers and Tuaregs, 3,000,000; Mued Arabs, 3,000,000; Shellah Berbers, 2,200,000; nomadic Bedouin Arabs, 700,000; negroes, 200,000; Jews, 150,000. Of the 5000 Christians in the country about 4000 are thought to be in Tangier. The inhabitants of Morocco are Sunnite Mohammedans of the Malekite sect. The population of Fez is about 140,000; Mequinez, 56,000; Morocco, 50,000; Tangier, 30,000.

Government, etc.—The government is an absolute despotism, the Sultan being the head of both civil and religious law. The Sultan is Mulai-Abd-el-Aziz, who has reigned since June 7, 1894. The ministers who assist him, but who have no executive authority beyond what he chooses to give them, are the grand vizier, chief chamberlain, chief administrator of customs, chief treasurer, and the ministers of foreign affairs, home affairs, and war. The army comprises about 10,000 infantry and 400 cavalry, besides 2000 irregular cavalry. The navy amounts to very little, consisting of only three or four small vessels. These include two gunboats, one having a displacement of 1200 tons, and an old iron screw vessel, while recently another gunboat was

building at Sampierdarena. The annual imperial revenue is about £500,000 (\$2,433,000).

Industries and Commerce.—Among the chief products are wheat, barley, maize, peas, beans, oil, esparto, and hemp; the fruits produced include figs, almonds, oranges, dates, lemons, pomegranates, and olives. Agriculture is in a backward condition, and the development of the general resources of the country is retarded by the barbarous government. The mineral wealth is said to be considerable, including copper, lead, tin, iron, antimony, coal, gold, and silver. Among the exports are wool, almonds, pease, beans, dates, gums, esparto, slippers, carpets, and leather. The imports include cotton, linen, and other textiles, provisions, iron goods, and other hardware. The imports and exports in 1896 amounted to £1,315,536 and £1,286,847 respectively; in 1897, imports £1,396,970, exports £1,114,136. Great Britain leads in both the import and export trade, with France and Germany ranking next. The chief ports are Tetuan, Tangier, Larache, Rabat, Mazagan, Mogador, Saffi, and Dar-al-Baida. The total tonnage entered at these ports in 1897 amounted to 949,376 tons, carried in 2038 vessels.

History.—A critic of England's policy toward Morocco declares that in recent years English interests in that country have not advanced. The French, on the other hand, according to this writer, have done much to promote their influence in Morocco. Recent events which have prejudiced the Sultan against the English were the attempt of a trading company to establish itself on Cape Juby, and of an English adventurer named Spilsbury to form a sort of protectorate in the Sous country in southern Morocco. The trading company tried to evade the excise duties in its dealings with the natives, and one of the traders was shot by the Moors. The British government obtained an indemnity, but the trading company was removed. The filibustering expedition of Spilsbury and his men resulted in a conflict with the natives. Spilsbury was charged with an assault on the Sultan's police, but acquitted at his trial, which occurred at Gibraltar. France has tried to keep on friendly terms with the Sultan in the interest of trade and internal developments. In 1897 and 1898 certain tribes in the Algerian province of Oran, which were under the protection of France, were injured by rival tribes in Morocco. An indemnity was demanded, but the Sultan postponed payment. In 1899 the French consul-general of Tangier went in person to Fez to present to the Sultan the claim for indemnity. In general, however, the Sultan showed a readiness to make concessions to France. He agreed to open two ports on the coast of Sous to foreign commerce, and to introduce certain measures of reform.

MORPHOLOGY. See ZOOLOGICAL LITERATURE; ZOOLOGICAL SOCIETIES.

MORTALITY. See VITAL STATISTICS.

MOTOR VEHICLES. See AUTOMOBILE.

MOUAT, Sir JAMES, K.C.B., died January 4, 1899. He was born in 1815, and was educated at University College, London, and in Paris. In 1838 he entered the army medical department. He served in the Crimea in 1854-55 and in New Zealand in 1860-65, being made surgeon-general in 1864. He was appointed honorary surgeon to the Queen in 1888, and was created K.C.B. in 1894.

MOWBRAY, Sir JOHN ROBERT, D.C.L., M.P., died April 22, 1899. He was born at Exeter, June 3, 1815; was educated at Westminster and at Christ Church, Oxford. He became a barrister at the Inner Temple in 1841. He was a Conservative member of Parliament for the city of Durham from 1853 to 1868 and for the University of Oxford from the latter year to the time of his death. He was father of the House of Commons. In 1858-59 and in 1866-68 he was judge-advocate-general, and in the latter two years and from 1871 to 1893 was church estate commissioner. He was created a baronet in 1880.

MUNICIPAL BATHS AND WASH-HOUSES. Germany was the first nation in modern times to establish public baths. Great Britain, however, was the first country to inaugurate the modern system of enclosed baths and wash-houses. Liverpool opened the first of these in 1842, and her example was quickly followed by cities and towns throughout the kingdom. Of the 65 county boroughs, with over 50,000 population, only 7 do not have public baths. Of the 250 smaller boroughs, 74 have public baths. During 1899 several English cities erected bathing establishments. Bradford is erecting a central establishment at a cost of about \$146,000, and five smaller district baths. In Poplar the foundation stone for new baths was laid December 7, 1899. Pancras is doubling its bathroom accommodations. Shoreditch opened a fine new bath-house, wash-house, and gymnasium in March. West Haven and Stratford are both constructing bath-houses, the latter to include a Turkish bath.

In the early part of October the engineer and superintendent of the Liverpool Municipal Baths presented some plans to the corporation for bath-houses suitable

for the very poor, and the corporation decided that one such bath should be erected as an experiment. The building is to have a frontage of 45 feet and depth of 75 feet. There will be a separate-entrance for men and women, with penny-in-the-slot type of arrangements for receiving admittance tickets. The bath halls are $28 \times 15\frac{1}{2}$ feet, providing for 10 men's rain baths and 4 women's rain baths, each having a dressing-box; also one slipper bath, so that women can bathe their children who are too young for a shower bath. The staff required is one man and his wife and a messenger boy. Free bath tickets are to be distributed on application by the medical health officer. The probable cost of the building is \$7200 to \$9700, and the annual cost of maintenance about \$1500. In Halifax, Manchester, and Rochdale, baths are furnished free to school children, and a movement to this end is under way in London.

Germany has municipal bath-houses in more than 45 of its cities having a population of over 50,000. France has fewer. In Austria, Norway, and Sweden, baths have been erected in the larger cities. Vienna has eleven. In the United States only ten or a dozen cities are reported as possessing any form of municipal bath-house. The small number of bathing establishments in America may be partly due to the greater prevalence of private bathrooms and to the bathing facilities connected with Y. M. C. A. buildings and athletic and other clubs. New York was constructing in 1899 on Rivington Street a building to accommodate 2000 bathers daily, and also wash-houses at the cost of \$95,000. New York already maintains five bathing places on the Hudson and nine on the East River. At these places, in 1899, about 3,870,000 baths were taken, of which one-fourth were by women and girls.

Two forms of bath are provided for in the modern bath-house—the slipper bath, so called because it is taken in a tub, usually covered at one end like a slipper, and the rain or shower bath. The most recent tendency seems to be in favor of the shower bath, as possessing the following advantages: It requires less space, less water (11, instead of 50 or 60 gallons), and less attendance, and is therefore cheaper. It is also more sanitary, because cleanliness is more easily maintained, and there is no danger of infection from the former occupant of the bath. There is also less danger that the bather will take cold.

A. Heessel Tiltman, in a paper read before the Royal Institute of British Architects in February, 1899, points out that while municipal bath-houses are very popular, they are not patronized by the class for which they were chiefly intended—the very poor. The twofold cause he gives is that the bath-houses are not sufficiently accessible, and that sufficient effort is not made to educate the masses in cleanliness. His scheme for reform proposes that the municipal system should embrace three types of bathing establishments: (1) The central establishments, containing swimming pools for both sexes, as well as slipper, shower, and hot-air baths; (2) the district bath and wash-houses to be much smaller, much nearer together, and located in the poorest and most crowded districts, each building containing not more than 50 rain-baths and from 30 to 50 washing compartments; (3) the people's baths, very small buildings, consisting of a series of double cells, $6 \times 3\frac{3}{4}$ feet, serving as dressing and washing compartments, the aim being to provide in the simplest and cheapest manner shower baths for the very crowded districts.

Municipal Wash-Houses.—These are usually constructed in connection with the municipal bathing establishments. In Glasgow the city furnishes power, water, and drying apparatus for about four cents per hour. In England a new and very beneficial addition to the wash-house department is a public crèche, where any washer having young infants with no one to take care of them at home may leave them free of charge during such time as she is engaged in the wash-house.

MUNICIPAL GOVERNMENT. The present article is confined to a discussion of some of the topics brought up at the annual meetings of the League of American Municipalities and the National Municipal League, and to a brief record of the municipal legislation of the year. The absence of official statistics for American municipalities has been the occasion of much complaint, and some of the organizations having to do with the improvement of municipal government—namely, the American Society of Civil Engineers, the National Municipal League, and the American Society of Municipal Improvements—made an effort in 1899 to have the Eleventh Census undertake the collection of complete municipal statistics. But the law providing for the census prohibits such additional subjects from being taken up until after the main schedules are completed in 1902. In the meanwhile, however, under a law passed in 1898 the Department of Labor has undertaken the collection of municipal statistics, and in the *Bulletin* for September, 1899, a large body of such statistics is presented, covering a wide range of information for cities having a population of 30,000 or more. There are more than 140 of such cities, and the statistics are too voluminous to be repeated here.

Meetings of Societies.—The annual convention of the League of American Municipalities was held at Syracuse, N. Y., September 19-22, 1899. Among the topics discussed were garbage collection and disposal (*q. v.*), the special assessment system

for public improvement, the question whether contract or day's work was the better system for municipal public works, the constitutional limitation of municipal indebtedness in relation to public improvements, and the administration of English municipalities. But by far the most important topic both in the matter of the papers read and in regard to the discussion that it occasioned was the general question of municipal ownership of public service industries. A brief résumé of the arguments may be presented here. On behalf of municipal ownership it was urged that where it had been adopted there had been a saving to the people and an improvement in the service rendered. In regard to municipal ownership of water-works, it was argued that the system was coming into general favor, that it prevailed throughout foreign countries, and that 1700 of the 3200 American works in existence in 1897 were under public ownership. A great many instances were cited of the success of municipal ownership in this field, as well as in lighting, street railway, and telephone systems. The argument was advanced that the people should do for themselves in the ownership of their public utilities what capital is doing for itself, and that the trusts furnished an object-lesson to the people in the matter of reducing the cost of production. Municipal ownership was favored also on the ground that it tended toward a higher morality and enhanced interest in municipal affairs. The pessimistic prophecies in regard to certain services when they were undertaken by city governments had not been fulfilled, and, on the contrary, there had generally been a reduction of the cost of service. On the other hand, one of the opponents of municipal ownership went so far as to say that money taken from taxpayers for expenditure on municipally owned industries was virtually confiscated. Mr. Robert P. Porter declared his opinion that the municipal ownership movement in the United States was a menace to sound government; that the movement had not made the progress in Great Britain that had been reported, and that the results where it had been practised there were by no means what had been claimed for them. It was a question whether in the matter of water, gas, and street lighting the United States or the United Kingdom was in the lead. Again, it was argued that public ownership meant a bad administration of the service; that the civil service would be insufficient; that clerks and other officers would receive higher salaries, and that under a democratic form of government it was doomed to failure. One speaker declared that municipal ownership of street railways abroad did not give as good results as private ownership in this country. He attributed this chiefly to the lack of an incentive to economize the operation of the municipal plants, and he stated that there was a population of 15,000 per mile of track abroad to 2600 in the United States. A critic of municipally managed industries reported that the cost of the municipal electric lighting plant in Detroit was far greater than the price for which a private company had offered to do the work, the difference in favor of the latter being \$29 in 1898. Professor E. W. Bemis, in answering Mr. Porter's criticism of municipal ownership in England and Wales, said that 45 out of the 64 county boroughs in those countries owned their water-works, that 21 per cent. of the street railway track was owned by municipalities, and that 42 per cent. of the English electrical lighting plants were owned by the cities and towns. Under a proper system of charges the profits should not be included in the cost. He presented figures to show that in a large number of cases the private lighting plants in this country were charging more than the municipal plants for street lighting.

The National Municipal League held its fifth annual meeting at Columbus, O., November 15-17, 1899. It devoted most of its time to the discussion of the "Municipal Programme" which had been framed in the previous year. This programme included a draft of a model charter, together with suggestions for constitutional amendments, which would be required in certain of the States for its adoption. Among the points brought out during the discussion were the fact that in the course of the year many improvements had been made in municipal government. As an instance of this it was pointed out that out of the 52,000 employees under the municipality of Greater New York, about 50,000 were under civil service or personal registration rules, and that in general there was a tendency toward non-partisanship and toward the conduct of city governments on business principles. One speaker declared that the chief causes of wastefulness in municipal expenditures were ignorance, partisanship, State interference, municipal irresponsibility, and indefiniteness of organization. The municipal programme tries to meet these dangers by introducing the principles of municipal home rule, of separation of the legislative and executive functions, of the merit system, of a uniform system of accounting, of nominations to office by petition, of short-term franchises, etc. There was considerable discussion of the Ohio municipal code, which was to be submitted to the legislature in January, 1900. This code is based largely on the municipal programme. It provides for cities and villages, the dividing line being a population of 3000. Some of the features of the municipal programme had gone into effect in a codification of the township laws of Indiana, and in Wyoming the principle of a uniform

system of accounting was established by the appointment of a State examiner of accounts, both municipal and State. In Minnesota and Indiana a beginning has been made along this line. In New York there was an attempt to secure uniform municipal accounts, but it was not successful.

Municipal Legislation.—The new charter for San Francisco went into effect on January 1, 1900. It has been upheld by the State Supreme Court. The chief conclusions reached by the commission appointed in 1898 to consider the municipal code in Ohio are stated by one of the members as follows: The old classification of cities should be abolished, and municipal corporations should be governed by local councils and not by the State legislature. The functions of city councils should be limited strictly to legislative matters, and administrative functions should be confined to the executive department of the cities, with the mayor as the responsible head. Subordinate offices should be filled by the merit system of appointment. Municipal officers, including members of the board of education, should be nominated and elected upon a non-partisan ballot. In New Jersey a general law relating to the government of cities under 12,000 empowered the city councils to make such ordinances, not contrary to the laws of the State or of the United States, as it may deem necessary for good government, etc., and a commission was established to report on the revision and codification of municipal laws. A similar extension of the powers of city councils was authorized in North Dakota by general law, and in South Carolina the municipalities acquired the right to adopt amendments to their charters on petition of a majority of the freeholders and on a majority vote of the electors. The eight-hour day for city laborers was adopted in many municipalities. Popular votes were given in its favor at municipal elections in Massachusetts. Another feature of municipal policy in 1899 was the tendency to substitute the day labor plan for contract work. See the articles on the separate States.

MUNICIPAL GYMNASIA. The first indoor municipal gymnasium ever constructed in the United States with public funds was formally opened in Boston on November 1, 1899. The structure cost \$28,000. It was erected from plans prepared by F. W. Howard, chief architect, division of the engineering department of the city. It covers an area of approximately 10,000 square feet. The style of the building is English domestic architecture. Provision is made for a gymnasium-hall giving a floor area of about 6800 square feet, with a clear height of 18 feet under the trusses. There is a running track, 18 laps to the mile, around the walls of the building, suspended from the trusses. It is raised at the corners, padded, and covered with rubber matting. The building is heated by steam from a boiler plant located in an adjoining brick building, and from this plant is supplied the hot water for bathing and toilet purposes. On the north side of the building are the office, coat-rooms, and locker-rooms, giving accommodations for 200 men; also dressing-rooms, toilet-rooms, and shower bathrooms. On the second floor are the accommodations for women. It is the intention to use the shower-room as a public bath. The building is lighted by electricity. It is thoroughly equipped with first-class apparatus. The management has been given to Mr. John W. Bowler, formerly superintendent of the Charlesbank gymnasium, Boston. An out-of-door public gymnasium was opened in Boston as early as 1826. Two instructors were employed, and a class of 400 pupils was formed, on whose roll many well-known names appear. But its popularity soon waned.

In the new bath-house at Shoreditch, England, completed in March, 1899, one of the rooms is to be used for baths only in the summer, being transformed into a public gymnasium in the winter. This seems to be a common practice in the English bath-houses. See **MUNICIPAL BATHS**; **PARKS**.

MUNICIPAL IMPROVEMENT, AMERICAN SOCIETY FOR, founded in 1894, had in 1899 a membership of 95, consisting of city engineers, commissioners of public works, street, sewer, and water-works superintendents, and other city officials. At the annual meetings a variety of papers were read on topics relating to municipal engineering and sanitation. The society publishes annual reports. President, A. D. Thompson, Peoria, Ill.; secretary, D. L. Fulton, Allegheny, Penn.

MUNICIPAL LEAGUE, NATIONAL, formed in 1894 to improve municipal government, had 115 affiliated associations in 1899. The League has published the *Municipal Program*, and *The Proceedings of the Columbus Conference for Good City Government*. Secretary, Clinton Rogers Woodruff, 1112 Girard Building Place, Milwaukee, Wis.

MUNICIPAL OWNERSHIP. See **ELECTRIC LIGHT AND POWER**; **ELECTRIC STREET RAILWAYS**; **MUNICIPAL GOVERNMENT**.

MÜNSTER, Prince GEORGE HERBERT, German ambassador to France, was the head of the German delegation at the peace conference which met at The Hague in May, 1899; in the following August Emperor William granted him the title of Prince of Derneburg. Prince Münster was born in London, England, December 23, 1820. From

1857 to 1865 he was Hanoverian ambassador at St. Petersburg, and in 1866, after the annexation of Hanover, was one of the first nobles of his state to give a hearty allegiance to the King of Prussia. He became a hereditary member of the Hanoverian-house of lords and marshal of the *Landtag* in 1867, and from that year sat occasionally in the North German and then in the German *Reichstag* as a Free Conservative. From 1873 to 1885 he served as German ambassador at London, and was then transferred to Paris, his present position, to succeed Prince Hohenlohe, now Imperial Chancellor. Prince Münster has done much to promote better relations between France and Germany. He has written: *Politische Skizzen über die Lage Europas vom Wiener Kongress bis zur Gegenwart*, 1867; *Mein Anteil an den Ereignissen des Jahres 1866 in Hannover*, 1867; *Der Norddeutsche Bund und dessen Übergang zu einem deutschen Reich*, 1868; *Deutschlands Zukunft, das deutsche Reich*, 1870.

MURRAY, JAMES ORMSBY, M.A., D.D., LL.D., dean of Princeton University, died at Princeton, N. J., March 27, 1899. He was born at Camden, S. C., November 27, 1827. He was graduated at Brown in 1850, after which he taught Greek there for one year; he then entered Andover Theological Seminary, being graduated in 1854. From this time until 1861 he was a Congregational clergyman in South Danvers (now Peabody), Mass., from 1861 to 1865 in Cambridgeport, Mass., and from the latter year to 1873 at the Brick Presbyterian Church in New York City. Dr. Murray was called to the chair of the English language and literature and belles lettres at Princeton in 1874, which position he thereafter occupied. His lectures became very popular. In 1886 the trustees of the university created the office of dean of the faculty, and elected Dr. Murray to the position. His degrees were received as follows: LL.D. from Brown in 1865, D.D. from Princeton in 1867, and M.A. from Princeton in 1896. Largely due to his influence was the adoption of the honor system in examinations at Princeton and subsequently the abolition of hazing. In 1893 and 1895 he delivered the L. P. Stone lectures at Princeton Theological Seminary, the first course being on *Scepticism in Literature* and the second *Religion in Literature*. Dr. Murray was compiler and editor of the hymnal, *The Sacrifice of Praise*. Among his best known works are *William Gammell: A Biographical Sketch with Selections from his Writings*; *George Ide Chace: A Memorial*; *Life of Francis Wayland*; *Introduction, with Bibliography, to Cowper's Poetical Works*; *Lectures on English Literature*. The recently endowed chair of English literature at Princeton, a call to which has been accepted by the Rev. Dr. Van Dyke, of New York, who, like Dr. Murray, also goes from the Brick Church, was named in honor of the popular dean. At the time of his death it was said that "few men in the academic world of this generation have made a deeper impression upon the young men under their care than Dean Murray." He was "a Christian gentleman of the old-time and all-time type; a man of fine natural qualities, full of humor, good sense, and with a gift for fellowship and friendship which made him the most companionable and lovable of men."

MUSEUM OF NATURAL HISTORY, AMERICAN, at Central Park West and Seventy-seventh Street, New York City, organized 1869, had in 1899 a membership of 1076. Has a large building, the corner-stone of which was laid in 1874, and has large collections of specimens, open to the public five days in the week. The museum conducts several series of lectures to public school teachers and others. President, Morris K. Jesup; secretary, John H. Winser.

MUSIC IN 1899. The year as a whole was particularly lacking in the production of any new works of the first importance or the introduction of any new celebrities. In Germany, Weingartner, Strauss, Muck, Mottl, and Nikisch continue to be the influential conductors; the younger Russian composers invade concert programmes in England and France as well as in Germany; the oratorio assumed more importance than usual owing to Perosi; the opera reasserted itself in the new world; and Paris lost a great conductor in Charles Lamoureux, who for many years had striven earnestly for recognition of German music in France. Death removed Johann Strauss, the composer of operas and waltzes; Amalie Joachim, the famous singer and wife of Joachim, the violinist; the Chevalier Antoine de Kontski, a contemporary of Beethoven, and a well-known pianist; Foli, an old opera singer (whose real name was Allan James Foley), and F. J. H. Prume, the violinist.

There were no new operas of any great importance. Much interest was felt in Siegfried Wagner's maiden effort, *Die Bühnhäuter*, presented for the first time in Munich on January 20. It was given in several German cities and even reached Prague, while excerpts found their way into concert halls in various parts of the world. There is little originality in the work. The hero, Hans Kraft, sells his soul to the devil, and can be redeemed only by the love of a faithful woman. The story, therefore, suggests *Tannhäuser* and *The Flying Dutchman*, but there is also a ring which three water-fairies try to steal from the hero. The musical themes of the opera are announced in the overture, and the orchestration is a strong feature of the whole work. Felix Weingartner con-

ducted his opera, *Genesius*, in Leipsic; Zollner's *Die Versunkene Glocke*, founded on Hauptmann's drama, was much liked in Berlin; and Bungert's *Circe* had its first performance in Hamburg. Other successful operas were Dvorák's *The Devil and Katie* (*Cert a Káca*), Prague; Wolf's *Der Corregidor*, Prague; Rudolph von Procházka's fairy opera, *Gluck*, Prague; Jan Blockx's *Heerberg-Princess*, The Hague; Granados's *Maria del Carmen*, Barcelona; Servais's *Ion*, Carlsruhe; Brauer, *Morgiana*, Carlsruhe; Falchi's *Trillo del Diavolo*, with Tartini as the hero, Rome; J. Stenhammer's *The Feast of Solhang*, after Ibsen, Stuttgart; Hallén's *Waldemar's Treasure*, Sweden; Puget's *Beaucoup de Bruit pour Rien* (on *Much Ado About Nothing*), Paris; and Massenet's *Cendrillon*, Paris. The revival of interest in Mozart occasioned the dramatic scenes, *Mozart and Salieri*, by Rimsky-Korsakoff, played in Moscow. Pushkin's text is used, and themes from Mozart are introduced. Sir Arthur Sullivan wrote a new comic opera; text by Basil Hood, London.

Notwithstanding the popularity of Wagner, many old operas were revived and proved highly successful. The model performances of Mozart's works in Munich, under Possart's careful direction, were imitated in other German cities. *The Magic Flute* received especial favor. It had a long run in Berlin, and thirty performances in Bremen, leading all other works in popularity. This opera was performed in London at the Lyceum Theatre by the students of the Royal College of Music. The interest in Mozart extended to London and New York, but an attempt to revive *Le Nozze di Figaro* in Milan, where it has not been heard since 1825, was not, however, successful. Weber's *Euryanthe* was revived at the Royal Opera, Berlin, under Richard Strauss with great success, and *Oberon* was revived at the Théâtre Lyrique, Paris, with such brilliant results that it is likely to remain in the repertory for a long time. Of course, Wagner's works had their share of popularity. *Der Ring des Niebelungen* was twice given in London, and three times in New York without cuts, and it was represented also at the Royal Theatre, Madrid, where it was a novelty. The text was translated into Spanish by Señor Cardanus. Richter, Mottl, and Muck conducted. A cycle of Wagner's works was given in Prague, with a performance of young Wagner's *Die Bärenhäuter*, the conductors being Mottl and Leo Bluh. The special performances of Wagner's works given annually in Munich began this year with the early and seldom heard opera, *Die Feen*. *Tristan und Isolde* was heard for the first time in Paris. It was given under the direction of Lamoureux; Frau Wagner went to Paris for the occasion. *Parsifal* travelled to Constantinople, where excerpts were given at the Græco-French Institute under Paul Lange. The Bayreuth festival began on July 22, with the *Ring*, conducted by Siegfried Wagner, and Hans Richter conducted *Die Meistersinger* and *Parsifal*.

A cycle of the dramatic operas by Smetana was given at the National Theatre, Prague, and Smetana's *Dalibor* was successfully revived in Leipsic. Berlioz's *Les Troyens* was played in Carlsruhe under Mottl, and *La Prise de Troie* was given at the Paris Opera. Méhul's *Joseph* was revived at the Paris Opera and was much liked. It was also successful in Milan. At the Opera Comique Adam's *Le Châlet* achieved its 1400th representation. This opera was also revived in London and was sung at Windsor at the Queen's request. Donizetti's *Don Pasquale* was revived in Berlin, and Verdi's *Ernani* in Dresden. An old opera by Spohr, *Die Kreutzfahrer*, the score of which was discovered recently in the archives of the Royal Theatre at Cassel, was performed there in May, during a competition of male choirs under the patronage of Emperor William. Lortzing's posthumous opera, *Regina*, had its first performance at the Royal Opera, Berlin, and was well received. *Pinafore* was revived in London. Perosi's oratorios were heard universally. *The Resurrection of Lazarus* failed to produce much impression in Berlin and New York. He conducted his new oratorio, *Il Natale del Redentore* (*The Nativity of Christ*), at Como for five successful days, September 19-22. The first performance of his new mass, *Benedicamus Domine*, which obtained the prize at the exhibition of sacred art in Turin, took place at the Church of the Sacred Heart, Turin, on April 2. August Klughart brought out a new oratorio, *The Destruction of Jerusalem*, Regensburg; Woyrsch, a "Passion oratorio," Frankfort-on-the-Main. Lortzing's oratorio, *Die Himmelfahrt Christi*, the score of which had long been lost sight of, was sung in Liegnitz with great success; Max Bouch brought out *Gustavus Adolphus*, Gotha; and Peter Benoit, a cantata for the Van Dyck festivities at Antwerp. Mendelssohn's *Elijah* was sung in Yokohama; and Sir Frederick Bridge gave an exceptionally fine performance of *The Messiah* at Albert Hall with the Royal Choral Society according to the Handel traditions and without the Mozart accompaniments. The same conductor gave a performance of Wagner's *Holy Supper of the Apostles* in London.

Among the other novelties of 1899 were a new song cycle by Liza Lehmann, *In Memoriam*, consisting of ten vocal numbers for baritone solo. It was first sung at a Saturday popular concert, November 23. Richard Strauss's new symphonic poem, *Heldenleben*, was given by the Museum Society, Frankfort-on-the-Main; Ernst von Dohnányi's new string quintet was played by the Chamber Music Union, London;

Felix Weingartner completed a new symphony and a new string quartet. Under Nikisch the Berlin Philharmonic Society played as novelties a new symphonic poem by Carl Gieitz, called *Fata Morgana*; a symphony in G minor, by César Franck; an unpublished symphony by Bruckner; a symphonic poem, *Antar*, by Rimsky-Korsakoff; Vincent d'Indy's symphony upon a mountain theme; Gernsheim's G minor and St. Saëns's A minor symphony. The chief novelties heard in New York in 1899 were: Frank Van der Stucken's *William Ratcliff*, a symphonic prologue; Vincent d'Indy's *Istar*, variations; Chabrier's *Bourée Fantastique*; Arthur Foote's A minor piano quintet; Richard Strauss's piano quartet; a psalm by Horatio W. Parker; a sonata for piano and violin by Mrs. H. H. A. Buch; a quintet by César Franck; a sonata for piano and violin by Walter Damrosch; a terzetto by Dvorák, and a piano trio by Henry Holden Huss. An interesting concert of ancient Greek music was given in Bremen. *The Hymn to Apollo*, discovered at Delphi, and a fragment of the *Orestes*, of Euripides, were heard.

The changes in the musical world were not many. Sir Hubert Parry succeeded Sir John Stainer as professor of music at Oxford; Sir A. C. Mackenzie resigned his post as conductor of the London Philharmonic, and was succeeded by Frederic H. Cowen; and Hans Richter made a fresh agreement with the Opera of Vienna to remain there until 1904, with the privilege of conducting the concerts in Halle and Manchester. Arthur Mees was elected director of the Mendelssohn Glee Club, of New York, and E. A. MacDowell was made president of the Manuscript Society.

A new conductor rose to fame in New York, Franz Kaltenborn, who first appeared at a song recital by Lilli Lehmann. His series of popular concerts in the summer were an unprecedented financial success, and established his reputation. Mascagni took his orchestra on a tour in Europe; Leandro Campanari's orchestra achieved renown in Milan by giving all of Beethoven's symphonies; Paderewski won universal admiration; Petschnikoff became famous with his violin; and Burgstaller played *Parsifal* successfully at Bayreuth. The visitors to the new world were numerous: Camille St. Saëns gave four concerts in Rio Janeiro; Frederic H. Cowen visited Canada; Blanche Marchesi gave song recitals in New York and other cities; Joseffy, Paderewski, Teresa Carreño, De Pachmann, Mark Hambourg, Sauer, Leopold Godowsky, Josef Weiss, Louis Breitner, Lady Hallé, Petschnikoff, Elsa Ruegger (the 'cellist'), Clara Butt, Adele aus der Ohe, and Willie Burmester appeared in concerts and recitals.

New York had a particularly successful opera season. The company included Marcella Sembrich, Lilli Lehmann, Jean and Édouard de Reszké, Van Rooy, Schumann-Heink, Albert Saléza, Carbone, Campanari, Plançon, Salignac, Clementine de Vere, Victor Maurel, Andreas Dippel, Marie Brema, Van Dyck, David Bispham, Emma Eames, Lilian Nordica, and Suzanne Adams. Three cycles of the *Nibelungen Ring* were given. *Lohengrin* had nine performances; *Faust*, eight; *Tannhäuser*, *Roméo et Juliette*, and *Die Walküre*, each seven; *Les Huguenots*, six; *Tristan und Isolde* and *Don Giovanni*, each five; *Das Rheingold*, *Siegfried*, *Die Götterdämmerung*, and *Aida*, four; *Carmen*, *La Traviata* and *Le Nozze di Figaro*, each three; *Lucia di Lammermoor*, *Rigoletto*, *Le Prophète* and *Ero e Leandro*, two; and *L'Africaine*, *Manon*, *La Favorita*, *Il Trovatore*, *Phlémon et Baucis*, and *Cavalleria Rusticana*, one each. The Grau company played in Boston, Chicago, and other cities. The Ellis and Damrosch opera company played chiefly in Philadelphia and Boston. Melba, Gadschi, Ternina, and Alvarez, who made his American *début* in Boston, January 25, were the principal singers. Puccini's *La Bohème* was given in Boston, January 9, with Melba. In the autumn the Grau company, with many of the same singers, and including Alvarez, had a season in Chicago and Boston before opening in New York.

In England two composers gained in reputation, Elgar and S. Coleridge Taylor; the musical season was brilliant. Richter gave concerts; Lamoureux conducted his orchestra in London; Sarasate, Dohnányi, Busoni, Chaminade, Moszkowski, Martucci, Rachmaninoff, Richard Strauss, Blanche Marchesi, Carreño, and Paderewski are among the artists who appeared in 1899. The opera opened in Covent Garden on May 8, with *Lohengrin*, conducted by Dr. Muck, of Berlin. The Grau company included: Frau Mottl, Litvinne, Mlle. Strakosch, Susan Strong, Eames, Schumann-Heink, Nordica, the De Reszkés, Scotti, Van Rooy, Dippel, Gadschi, Van Dyck, Zélie de Lussan, Lucienne Bréval, Melba, Lilli Lehmann, and Bispham. The season closed July 24. *Faust* was given seven times; *Lohengrin*, six; *Roméo et Juliette*, five; *Tannhäuser*, five; *Carmen*, five; *Aida*, four; *Pagliacci*, four; *La Bohème*, four; *Tristan und Isolde*, four; *Cavalleria Rusticana*, three; *Die Walküre*, three; *Don Giovanni*, three; *Die Meistersinger*, three; *Der Fliegende Holländer*, two; *Les Huguenots*, two; *Lucia di Lammermoor*, two; *Norma*, two; *Fidelio*, one; *Ero e Leandro*, one; *Rigoletto*, one, and *Le Châlet*, one. Isidore de Lara's *Messaline* was also given with Mlle. Héglon, Leclerc, Alvarez, and Renaud. Schumann's music to

Byron's *Manfred* was given for the first time in London on June 21, and Sir A. C. Mackenzie wrote incidental music for *Manfred*.

Broadwood raised an important question with regard to the lowering of the pitch of pianofortes. There has been a general rise of pitch during the present century, and at the same time an increasing movement to check that rise and follow the "normal" or "continental" pitch, determined by the French commission of 1858, which decided that the middle A should equal 435 vibrations.

The library of the British Museum acquired a collection of 35 unknown madrigals, three being by Palestrina; the Bibliothèque de l'Opéra, Paris, was presented with Albani's piano by Mme. Marie Marimon. A new manuscript by Schubert was discovered, bearing the date "Wien im November, 1825," and in one corner the word, "Schwammerl," a nickname of Schubert. The manuscript was sold at auction in Ziegelhausen, near Heidelberg.

There were many musical festivals during 1899. The Allgemeiner Deutscher Musikverein met at Dortmund; a musical festival was held in Meiningen from October 7 to 10 in connection with the unveiling of the Brahms memorial. Brahms's *Deutsches Requiem*, *Triumphlied*, *Tragic Overture*, and Second and Fourth symphonies were played, and also works by Haydn, Schubert, Mozart, Schumann, and Beethoven, including the *Ninth Symphony* and *Fidelio*. At Cassel eighteen German male societies had a festival under the patronage of the Emperor. The Cologne Maennergesang-Verein carried off the first prize. The jury included Reinecke, Schuch, Wüllner, and Richard Strauss. At the musical festival on the Lower Rhine, held in Düsseldorf, the following were performed: Beethoven's *Missa Solemnis*; Bach's cantata, *Halt in Gedächtniss Jesum Christum*; the prelude to *Parsifal*; Liszt's symphonic poem, *Orpheus*; Beethoven's triple concerto; R. Strauss's new symphonic poem, *Heldenleben*; Mendelssohn's *Walfurgis Nacht*; Schumann's symphony in B flat; R. Strauss's *Don Quixote*; Brahms's *Rhapsody*, for contralto solo and male choir, and the second act of Cornelius's *Barber von Bagdad*. The conductors were Richard Strauss and Butts.

At the Worcester festival, England, S. Coleridge Taylor, Elgar, and Horatio W. Parker attracted attention with new works. The last named conducted his *Hora Novissima*, a setting of Bernard de Morlaix, for soli, chorus, and orchestra, which was admired. S. Coleridge Taylor's *Solemn Prelude*, for orchestra, was performed and Elgar's *Lux Christi* and *Orchestral Variations on an Original Theme* were conducted by the composer. At the Norfolk and Norwich festival Randegger conducted Berlioz's *Faust* and Perosi's *Passion of Christ*. Sir Hubert Parry's *Song of Darkness and Light*, Elgar's *Lux Christi*, Cowen's *Ode to the Passions and Endymion*, S. Coleridge Taylor's *Hiawatha's Wedding Feast*, Verdi's new sacred works, and Dvorák's biblical songs were performed. There were also festivals in North Staffordshire and in Sheffield. The London Musical Festival (Mr. Robert Newman's series of concerts), May 8-17, was a colossal enterprise. There were two orchestras; one, led by Mr. Henry J. Wood; the other, by Charles Lamoureux; Paderewski, Ysaye, and Lady Hallé appeared. Perosi's *Transfiguration of Christ*, *The Raising of Lazarus*, and the *Ressurrection of Christ* were given. An Irish Musical Festival (Feis Ceoil) was held in Dublin (May 15-20). Plunkett Greene and Miss Florence Daly were among the solo singers. The competitions lasted a week, ending in a band contest. Various prizes were offered. Holyoke, Mass., had a festival, with C. S. Cornell as conductor. Haydn's *Creation*, Rossini's *Stabat Mater*, and S. Coleridge Taylor's *Hiawatha's Wedding Feast* were performed. Musical festivals were also held in Toronto, Albany, Lincoln, Springfield, Louisville, Ann Arbor, and Worcester. During the year there were many honors paid to famous musicians in the way of monuments and special performances.

The anniversary of Richard Wagner's death was celebrated in Venice on February 13. Selections from his works were performed in St. Mark's Square, and a marble bust of Wagner was unveiled in the Teatro Fenice, where a special performance of *Die Walküre* was given under Signor Vitale. Paris celebrated the centenary of the birth of Halévy on May 27 by a performance of *L'Eclair* and excerpts from his other works at the Opéra Comique. The death centenary of Cimarosa was commemorated in Aversa; the birth centenary of Lwoff, composer of the Russian national hymn, was celebrated in St. Petersburg. Mayence honored the twenty-fifth anniversary of the death of Peter Cornelius. Berlin performed *Die Fledermaus* at the Royal Opera House, in memory of Johann Strauss, and the same opera, and also Brahms's *Requiem*, were sung in Vienna to commemorate him. Verdi celebrated his eighty-sixth birthday; Marchesi her fiftieth anniversary as a teacher; and a great festival concert was given in Berlin to celebrate the sixtieth anniversary of Joseph Joachim's first public appearance. At the cycle of Goethe's works, performed in Düsseldorf, in honor of the one hundred and fiftieth anniversary of the poet's birth, *Egmont* was given with Beethoven's music.

A monument to Brahms, by Hildebrand, was unveiled at Meiningen; one to Hans von Bülow, by Hildebrand, in the Ohlsdorf cemetery, near Hamburg; one to Ambroise Thomas, by Falguière, was placed in the Parc Monceau, Paris. The Liszt Denkmal of Weimar offered three prizes for designs for a monument to cost 40,000 marks. Leipzig voted 5000 marks toward a monument to J. S. Bach; Weimar awarded a prize to Hermann Hahn, of Munich, for a design for a statue of Liszt; Prague decided to erect a statue to Mozart, and gave a performance of Humperdinck's *Hänsel und Gretel* to raise funds; and Düsseldorf voted funds to erect monuments to Mendelssohn and his friend Immermann, the poet. A tablet to Glinka was unveiled on the house in which he died in Berlin. A concert of Glinka's works was given in Berlin by his pupil, Balakirew. Lille named a square *Roi d'ys* in honor of Édouard Lalo, a native of that city.

The King of Greece subscribed \$2400 toward the erection of a national theatre in Athens for operatic and dramatic performances; a new Beethoven Saal was inaugurated in Berlin on January 2 and 3, with the Philharmonic Society, under Herr Rebizek, and the Joachim Quartet; and the Norwegian government granted 1000 crowns to the composer Elbing, to enable him to collect old Norwegian folk-songs. A Hochschule für Musik was opened in Mannheim, October 2, with Wilhelm Bopp as director; a northwest London choral society was founded with Frederic H. Cowen as president, for the production of little known choral and instrumental works; and an Oxford and Cambridge Musical Club was founded in London with Dr. Joachim as president. Among its 200 members are Arthur J. Balfour, Sir J. F. Bridge, Sir A. C. Mackenzie, Dr. Hans Richter, and Sir Hubert Parry. Warsaw decided to establish a Philharmonic Society, Jean de Reszké and Paderewski serving on the committee, and a new philharmonic orchestra was organized in Vienna under the direction of Carl Stix.

MUSICAL ART SOCIETY, organized in New York in 1893 to bring before the musical public the works of Palestrina, Bach, and other old masters, had in 1899 a chorus of 55 professional singers. Two concerts are given annually—in December and in March. President, Frederick E. Hyde; musical director, Frank Damrosch; secretary, Miss Laura J. Post, 24 East Thirty-third Street, New York City.

MUSICIANS AND COMPOSERS, SOCIETY OF AMERICAN, organized in 1899 from the Manuscript Society, with the object of promoting the interests of musical composition in America. It has 500 members, and holds six private meetings and two public concerts annually. President, Edward MacDowell; secretary, Lucien G. Chaffin, 26 East Twenty-third Street, New York City.

MYSTIC SHRINE, NOBLES OF THE, is an ancient Arabic order, and while not a regular Masonic body, is composed of Masons who have reached the Thirty-second degree, Ancient Accepted Scottish Rite (eighteenth degree in England), or Knights Templars in good standing. The latest reports give 81 temples in the United States, with a total membership of about 52,000.

NAIRNE, Sir CHARLES EDWARD, K.C.B., general in the British army, died February 19, 1899. Born in London, June 30, 1836, and educated privately and at Addiscombe College, he entered the Bengal Artillery as a second lieutenant in 1855, transferring to the Royal Artillery in 1861. He served against the Indian mutiny in 1857, winning a medal for meritorious services; in 1863 he took part in the Euzofzai expedition, and the following year was promoted captain. He served honorably in the Kabul campaign of 1879 and in Egypt in 1882. He was promoted through the various grades, becoming a major-general in 1890 and a lieutenant-general in 1895. From the latter year to the time of his death he was in command of the forces at Bombay.

NASH, GEORGE KILBON, governor of Ohio, was elected to that office, as a Republican, November 7, 1899. Born in Medina County, O., August 14, 1842, he was educated at the Western Reserve University and Oberlin College, but relinquished his course before graduation, and taught school. He studied law and was admitted to practice; for a time was editor of the *Ohio State Journal*, and subsequently was appointed chief clerk in the office of the Ohio secretary of State. From 1879 to 1882 he was prosecuting attorney of Franklin County, and from 1883 to 1885 was judge of the State Supreme Court, after which he practised law at Columbus. For a number of years he was a member and chairman of the State Republican committee, and has long been active in State politics. At the election of November 7, 1899, the vote for Governor stood: Nash, 417,199; John Roll McLean, Democrat, 368,176; Samuel M. Jones, Independent, 106,721.

NATAL, a British South African colony, lying northeast of Cape Colony, with a frontage on the Indian Ocean of about 375 miles, has an area of about 30,000 square miles and an estimated population in 1899 of from 850,000 to 900,000, comprising mostly Kaffirs, with about 61,000 Indians and 60,000 whites. The bulk of

the white population is British, but the Dutch Boers are the most numerous in the northern districts. The capital is Pietermaritzburg, population about 25,000, which is situated 50 miles inland from Durban (Port Natal), the only port, with a population of about 40,000.

The principal occupation is agriculture, and the crops raised include cereals, vegetables, tea, and sugar. Wool also is produced. Among minerals iron is found, and the mining of coal is an increasing industry. Of the total area of Natal, about 2,250,000 acres have been set apart for native occupation. The trade is steadily increasing and is enlarged by a considerable amount of Transvaal imports and exports, which reach their destination through the port of Durban. The total imports of Natal in 1898 amounted to £5,323,216, mostly from Great Britain. The principal items were apparel, haberdashery, machinery, iron and iron goods, flour and grain, leather goods, spirits, cottons and woollens, etc. The exports in 1898 amounted to £2,184,667, of which wool was the most important item. Other exports are coal, gold, hides and skins, Angora hair, sugar, and bark. Recent Natal trade has been somewhat affected by drought and pests. The colonial revenue is derived mainly from posts and telegraphs, land sales, customs, stamps, excise, licenses, the native hut tax, and railways. The expenditure is devoted mainly to public works, defence, and railways. There are nearly 500 miles of railway, which have been constructed and are operated by the government. Defence is provided for by a body of mounted police, numbering about 550 Europeans, a volunteer force of about 1400, and a small volunteer naval corps. These forces were, of course, greatly increased in 1899. Education has state aid, and has made considerable progress.

Natal was first settled in 1824 by a small force of Englishmen, and in 1843, in spite of the efforts of Boers who had immigrated from Cape Colony and attempted to set up a government, the territory was proclaimed British, and annexed to Cape Colony. Thirteen years later it became a separate colony, the government of which was perfected in 1893. Later Zululand (*q. v.*) and British Amatongaland were annexed as provinces. The government consists of a governor, a legislative council of 12 members, nominated by him, and a legislative assembly of 39 members, elected by popular vote.

Northern Natal was one of the two important fields of the British-Boer war in 1899, the first Boer invasion being across the frontier of Natal in October under the direction of General Joubert. The first important battles were fought in Natal, namely, at Glencoe and Elandslaagte, in which the British were successful, and also at Rietfontein. The Boers, however, proclaimed all Natal north of the Tugela River Orange Free State territory. They were successful in engagements about Ladysmith, and besieged General White and an imperial force of about 9000 men in that town during the remainder of the year, although they were unable to force his surrender. During this time they swept over a large part of the colony. The forces of the Boers at one time threatened Pietermaritzburg, but retired after partially cutting off communications with the capital. In the latter part of November the Boers were driven out of the region south of the Tugela River, but on December 15 General Buller, in attempting to cross the Tugela for the relief of Ladysmith, met with a severe repulse, making with the British reverses at Stormberg and Magersfontein in Cape Colony the third defeat by the Boers within one week. See TRANSVAAL (paragraphs on History).

NATIONAL ACADEMY OF SCIENCES. See ZOOLOGICAL SOCIETIES.

NATIONAL EXPORT EXPOSITION, held in Philadelphia, Penn., September 14 to December 2, 1899, under the auspices of the Philadelphia Commercial Museum and the Franklin Institute, was the first national exposition of American manufactures specially suited for export trade that was ever held in this country. Its purpose was to demonstrate the ability of the American manufacturer to supply the world with every article which may be needed in any foreign market. About \$1,000,000 was spent in the erection of the buildings, covering nine acres of ground, and in the preparation of the grounds. The exhibits, numbering nearly 1000 in all, represented more than half a billion dollars of invested capital, and were said to be the most complete collection of domestic and foreign manufactures ever brought together. The exposition was a success in every way. The attendance was very large, and the manufacturers made important business connections all over the world. The president of the exposition was P. A. B. Widener, and Dr. William P. Wilson was the director-general.

NATIONAL GALLERY, Trafalgar Square, London, is the chief art gallery in Great Britain, and was founded in 1824 by the purchase of the Angerstein collection of 38 pictures. The gallery now contains fine examples of the work of most of the great masters. The latest report shows the annual number of visitors to have been 422,913 on the 209 free days. On Sunday afternoons there were 30,635 visitors, and on students' days, 39,349. The gallery is open to the public on all week days, except

Thursday and Friday. Director, Sir E. J. Poynter, president of the Royal Academy; Hawes Turner is keeper and secretary.

NATIONAL MUSEUM. See ANTHROPOLOGY IN AMERICA.

NATURAL GAS. The value of natural gas in the United States in 1898 amounted to \$15,296,813. This does not include the amount of Canadian gas consumed in Buffalo and Detroit. No new fields of large extent were discovered in 1898, although some large wells were found in old territories, as southwestern Pennsylvania, West Virginia, and central Ohio. The pressure in many of the present fields is becoming lower from year to year, although this reduction in the pressure, due to the slow exhaustion of the fields, is being met by the invention of various types of regulating machinery, which tend to economize the gas used. The tabulation of the uses to which natural gas is being put at the present day shows: Domestic fires, 571,998; iron mills, 34; steel works, 10; glass works, 154; other uses, 3314.

NATURAL SCIENCES, ACADEMY OF (Philadelphia), founded in 1812, had in 1899 a membership of 600. The academy meets weekly, publishes *Journal*, *Proceedings*, etc. President, Samuel G. Dixon, M.D.; secretary, Edward J. Nolan, M.D., Logan Square, Philadelphia, Penn.

NAVAL ARCHITECTS AND MARINE ENGINEERS, SOCIETY OF, organized in 1893 for the promotion of ship-building and marine engineering, had in 1899 a membership of 700. The society publishes *Transactions*. General meeting for 1900 at New York, in November. President, Clement A. Griscom; secretary, Francis T. Bowles, U.S.N., 12 West Thirty-first Street, New York City.

NAVAL ORDER OF THE UNITED STATES was organized in 1890 and the general commandery in 1893. There are State commanderies in Massachusetts, Pennsylvania, New York, California, and Illinois, and in the District of Columbia. The members are (1) veteran officers and their male descendants, and (2) enlisted men who have received the naval medal of honor. The next triennial meeting is to be held in New York in 1902. General commander, Rear-Admiral John G. Walker; general recorder, Lieutenant-Commander Leonard Chenery.

NAVAL VETERANS, NATIONAL ASSOCIATION OF, organized in New York in 1887 to perpetuate the names and deeds of the men of the American Navy, to assist widows and orphans of members, and to encourage the building of an efficient navy, had in 1899, 41 local societies, a paid membership of over 8500, and 3000 contributing members. Commodore commanding, George L. Seavey, Chicago, Ill.; fleet secretary, George E. Haskins, 767 Washington Avenue, Brooklyn, N. Y.

NAYLOR-LEYLAND, Sir HERBERT SCARISBRICK, member of Parliament, was born January 24, 1864; died May 7, 1899. He retired as captain of the Second Life Guards in 1895. From 1892 to 1895 he represented Colchester in Parliament as a Conservative. In the latter year he was created a baronet, and in politics became a Liberal and Home Ruler. He successfully stood for Parliament in 1898 in the Southport division of Southwest Lancashire, succeeding to the seat vacated by George N. Curzon when the latter became viceroy of India as Lord Curzon of Kedleston.

NEBRASKA, a central western State of the United States, has an area of 77,510 square miles. The capital is Lincoln. Nebraska was admitted to the Union, March 1, 1867.

Mineralogy.—Coal-mining has been confined to the southwest corner of the State, but the seams are so thin that the industry has never become profitably established. In 1896 a total of 3560 short tons was mined in Dixon County; in 1897 the output was only 495 tons, and in 1898 mining was entirely suspended. The only industry that showed an increased production during 1898 was quarrying, which yielded an output of limestone valued at \$78,493 against a value of \$42,359 in 1897. The product was used almost entirely for building and road-making. See ABRASIVES.

Manufactures.—During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$2,158,729, and for the three States, constituting the Nebraska collection district—Nebraska, North Dakota, and South Dakota—\$3,428,079, showing that the bulk of these manufactures were in Nebraska. The district contained 40 manufactories of tobacco and 314 of cigars, and the combined output in the calendar year 1898 was 17,904,761 cigars and 41,236 pounds of smoking tobacco. In the fiscal year 1898-99 the quantity of spirits rectified was 389,266 gallons; distilled spirits gauged, 5,300,495 gallons; and fermented liquors produced, 216,665 barrels. The maturing of the corn crop in 1899 caused the opening of many new industries and an exceptional increase in the volume of all lines of business. Cash for grain and corn began pouring into the State about October 1, and within a short time every manufacturer was working his force overtime, in order to supply demands. The unusually heavy traffic practically blockaded

all the large railroads, which were unable to buy or borrow sufficient cars for their unexpected needs. Viewing all the industrial activities of the State, it may be said that there was never a time in the history of Nebraska when the evidences of prosperity were so numerous as in the closing months of 1899, and that never before was the industrial condition so favorable.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at Lincoln and Omaha aggregated in value \$394,825, an increase in a year of \$89,356; and exports at Omaha, \$250,791, increase in a year, \$244,191.

Railways.—The new railway construction during the calendar year 1899 amounted to 59.85 miles, giving the State a total mileage of 5598.42.

Banks.—On October 31, 1899, there were 99 national banks in operation and 70 in liquidation. The active capital aggregated \$9,710,000; circulation, \$2,832,781; deposits, \$18,273,289; and reserve, \$6,851,432. The State and private banks combined, June 19, 1899, numbered 398, and had capital, \$7,232,485; deposits, \$21,025,766; and resources, \$30,053,677. The exchanges at the United States clearing houses at Omaha and Hastings in the year ending September 30, 1899, aggregated \$316,568,530, an increase in a year of \$14,201,943.

Education.—At the close of the school year 1897-98 the school population was 366,069; enrolment in the public schools, 273,914; and average daily attendance, 173,930. There were 9608 teachers, 6676 buildings used as school-houses, and public school property valued at \$8,943,924. The revenue was \$3,829,155; expenditure, \$3,712,017, of which \$2,449,834 was for teachers' salaries. There were 225 public high schools, with 511 secondary teachers, 13,403 secondary students, and 5017 elementary pupils; 14 private secondary schools, with 61 secondary teachers, 513 secondary students, and 856 elementary pupils; a public normal school, with 20 teachers and 699 students in all departments; and 4 private ones, with 55 teachers and 2615 students. Normal training was also given in 6 colleges and 4 public high schools. Twelve universities and colleges for men and for both sexes reported 25 fellowships, 19 scholarships, 338 professors and instructors, 3590 students, 77,520 volumes in the libraries, valued at \$135,800; \$225,650 invested in scientific apparatus, \$1,844,400 in grounds and buildings, and \$453,952 in productive funds; \$245,061 in total income and \$33,007 in benefactions. In 1899 there were 614 periodicals, of which 31 were dailies, 532 weeklies, and 34 monthlies.

Building and Loan Associations.—Reports for the half year ending June 30, 1899, show a decrease in the number of associations, a greater concentration of associations in the cities and towns, a falling off in the farming communities, and, despite reduced numbers, a material increase in business transacted. The 60 remaining associations had 79,973 shares in force and combined assets of \$3,331,042.

Finances.—The total assessed valuation of property in 1898 was \$167,830,822. Besides the bonded debt of \$153,267, all held in the permanent school fund, that fund contained cash, \$238,468; United States bonds, \$15,000; and bonds of various Nebraska counties, \$3,033,029—total holdings, \$3,439,764.

Population.—As estimated by federal officials, the population on June 30, 1899 was about 1,410,000.

Legislation.—The election of a successor to United States Senator William V. Allen (Pop.), occupied the time of the legislature from January 7 to March 8, when the 42d ballot resulted in the election of Judge Monroe Leland Hayward (*q. v.*), whose death on December 5 following made a vacancy again, which was filled by the appointment by Governor Poynter of ex-Senator William V. Allen. The legislature abolished the power formerly exercised by justices of the peace to arrest in civil actions before judgment for fraudulent causes. It authorized the formation of mutual companies to furnish surety for members who occupy places of trust. The blanket system of voting was amended so that a vote may be cast for all Presidential electors and individually for all other candidates. Candidates for nomination and election are forbidden, under heavy penalties, to expend money for any purpose, except personal expenses, which are limited to \$100 where there are 5000 voters, and to \$1 for each 100 voters where there are not over 50,000 voters. After both nomination and election each candidate must file a verified statement of his expenditures fully itemized, and treasurers of parties must also file such statement. A State board is to be appointed to examine and license embalmers, and another one to examine and license barbers. A constitutional provision prohibits the creation of executive officers by legislative enactment, so the governor was made insurance commissioner, with power to appoint a deputy to perform the labor, and an elaborate law was passed regulating the formation, licensing, and operation of all insurance companies. In the same way, the governor will be food commissioner, and his deputy is to inspect and control the manufacture and sale of butter, cheese, and vinegar. Imitation of said foods must be marked and vendors licensed. Labor laws were passed in the interests of women and children. Railroads must not work trainmen or telegraph operators more than eighteen hours consecutively.

Party Platforms.—The Democratic, Populist, and Silver Republican State conventions were held in Omaha, August 22, 1899. These parties adopted a platform endorsing the Chicago platform of 1896, favoring an income tax, election of United States senators by popular vote and the initiative and referendum, and condemning the war against the Filipinos; it also demanded legislation by means of which the monopolization of industry by private corporations may be absolutely prevented.

The Republican State convention was held in Omaha, September 21, 1899, and a platform was adopted heartily endorsing what they deemed the wise, conservative, and patriotic administration of President McKinley, and approving his Philippine policy; expressing unequivocal adherence to the gold standard and unalterable opposition to the free coinage of silver; denouncing the alleged attempt again to array labor and capital against each other, and favoring the creation by act of Congress of a bureau of supervision and control of corporations engaged in interstate business, with powers similar to those exercised over national banks by the controller of the currency, enforcing such publicity and regulations as shall effectually prevent dishonest methods and practices.

Election.—The election in Nebraska was merely for one justice of the Supreme Court and two members of the board of regents of the State University, but it was considered important by Mr. Bryan and his friends, for the sake of its bearing on the situation in 1900. The three pro-silver parties not only united upon a platform, but also made up a fusion ticket, selecting a Populist, ex-Governor S. A. Holcomb, as their candidate for the Supreme Court. To each of the other parties was accorded one of the nominations for State regent. Judge Holcomb received 109,320 votes; Manoah B. Reese, the Republican candidate, 94,213. The result was conceded to be in large measure a personal victory for Mr. Bryan, who pronounced it a protest against the policy of the federal administration.

State Officers and National Representatives.—Governor, William A. Poynter; lieutenant-governor, E. A. Gilbert; secretary of state, W. F. Porter; treasurer, J. B. Meserve; auditor, J. F. Cornell; attorney-general, C. J. Smythe; adjutant-general, P. H. Barry; superintendent of education, W. R. Jackson. Supreme Court: Chief justice, T. L. Norval; associate justices, J. J. Sullivan, S. A. Holcomb; clerk, D. A. Campbell. The State legislature consists of 73 Republicans and 60 Fusionists. Senators, John M. Thurston (Rep.), from Omaha, and William V. Allen (Pop.), from Madison (*vice* M. L. Hayward [Rep.], who died December 5, 1899). Representatives, E. J. Burkett (Rep.), from Lincoln; David H. Mercer (Rep.), from Omaha; John S. Robinson (Dem.), from Madison; William L. Stark (Pop.), from Aurora; R. D. Sutherland (Pop.), from Nelson; William Neville (Pop.), from North Platte.

NEELY, HENRY ADAMS, D.D., Protestant Episcopal bishop of the diocese of Maine, died in Portland, October 31, 1899. He was born at Fayetteville, N. Y., May 14, 1830. After his graduation in 1849 at Hobart College, Geneva, N. Y., he was a tutor there for two years, was ordained to the diaconate in 1852, and consecrated to the priesthood in 1854. In 1853-55 he was rector of Calvary Church, Utica, and rector of Christ Church, Rochester, from 1855 to 1862; he then returned to Hobart College, where for two years he was chaplain. In 1864 he became assistant rector of Trinity Church, New York, and rector of Trinity Chapel, in which position he remained until he was consecrated second bishop of Maine on January 25, 1867. From 1889 to 1895 he was chairman of the House of Bishops. Through the influence of Bishop Neely was brought about the construction of the Portland cathedral, which was consecrated in October, 1877, and which at the time was one of the few Protestant Episcopal cathedrals in America. He established two parochial schools, St. John's School for boys, at Presque Isle, and St. Catharine's Hall, a seminary for young women, at Augusta. On December 13, 1899, the Rev. Dr. Robert Codman, Jr., of Boston, was elected to succeed Dr. Neely as bishop of the Maine diocese.

NETHERLANDS, THE KINGDOM OF THE, bounded on the north and west by the North Sea and on the east by Germany. The area is 12,648 square miles, and the estimated population on December 31, 1897, was 5,004,204. The density of population is 396 to the square mile. Emigration and immigration are inconsiderable, though the emigration to the United States in the fiscal year 1898-99 was 1029, an increase of 262 over the preceding year. The seat of government is The Hague, with an estimated population (December 31, 1897) of 196,325, the chief cities being Amsterdam, which had then an estimated population of 503,285, and Rotterdam, with 208,433. The other cities with a population of over 50,000 are Utrecht, Groningen, Haarlem, Arnheim, and Leyden. Transportation in the country is largely by means of canals, of which there are about 1907 miles, and by means of the 3000 miles of other navigable waterways. The railways in 1896 amounted to 749 miles. The chief crops of the country in order of value of exports are wheat, rye, oats, and potatoes; but in amount of production,

beet-root, tobacco and madder. There is an important herring fishery, valued in 1897 at \$5,567,756, and oyster trade. The reports for 1897 show 544 distilleries, 10 sugar refineries, 31 beet-sugar refineries, 47 salt-work works, 92 vinegar manufactories, and 498 breweries. There were in the same year 5075 steam engines in the country and 4375 manufactories making use of steam engines.

Commerce.—The Netherlands are very important from a commercial point of view. The imports were estimated in 1897 to amount to \$682,911,000, and the exports for the same year were estimated at \$599,820,000. The percentage of trade was as follows: To Prussia, 50 per cent., from Prussia, 17; to Great Britain, 21 per cent., from Great Britain, 15 per cent.; to Belgium, 12 per cent., from Belgium, 10 per cent.; to the East Indies, 4 per cent., from the East Indies, 14 per cent.; to Russia, 4 per cent., from Russia, 16 per cent.; to the United States, 3.5 per cent., from the United States, 10 per cent. The tonnage of vessels reported as entering and clearing the three Dutch ports in 1897 were: Entered Rotterdam, 5,071,050, Amsterdam, 1,335,996, Flushing, 668,706; and cleared at Rotterdam, 1,826,114, Amsterdam, 877,920, Flushing, 662,334. The most extensive traffic is with the Dutch colonies, and with South America. Lines of steamers ply between Rotterdam and New York, Philadelphia, Baltimore, Newport News, New Orleans, Mobile, Charleston, Savannah, and other ports in United States and Cuba. American lumber is in demand.

Religion and Education.—The royal family and most of the population belong to the Reformed Church, which is governed by a synod holding annual conferences at The Hague. Entire religious freedom is allowed, the other sects of most importance being the Roman Catholics, the Jews, and the Jansenists. The higher education is given at the universities of Leyden, Utrecht, Groningen, and Amsterdam. In 1897 but 4 per cent. of the conscripts could neither read nor write, and in 1896 only 9 per cent. of the total number of children of school age had received no elementary education. An effort was made in the legislature in 1899 to make education compulsory. For education the sum of \$301,232 was expended on government middle-class schools, \$208,786 on polytechnic schools, \$40,080 on technical schools, and \$185,600 on agricultural and horticultural schools. Navigation is taught in schools at Rotterdam, Harlingen, Terschelling and Helder.

Revenue and Expenditure.—The budget estimate of expenditure for the year 1899 was 152,613,959 guilders and of revenue 140,796,900. The largest part of the revenue is derived from excise taxes, next in importance being indirect taxes, post-office receipts, land tax, import duties. The separate budget for the colonies not included in the preceding figures shows for 1899 an estimated revenue of 132,742,514 guilders, and expenditure, 146,085,944. The gold standard is practically though not nominally the standard of currency in the Netherlands. The unit of currency is the guilder, which is equivalent to \$0.402.

Army and Navy.—The army, formed partly by conscription and partly by enlistment, consists on a war footing of 68,000 men, not including officers, and a militia of about 44,000; in peace the number in June, 1897, was 1971 officers and 27,834 men. A Dutch navy is gradually being formed, the programme introduced in 1897 providing for a fleet by 1910 composed of 6 armored vessels, 12 protected cruisers, 6 monitors, 15 gunboats and 32 torpedo-boats. Four cruisers have already been launched, the *Utrecht*, an armored cruiser of 4000 tons, being completed at Amsterdam in 1899. Three others are to be completed in 1900. Besides these the present fleet consists mostly of old and inefficient vessels.

Colonies.—The Dutch colonies include part of Borneo (203,714 square miles, population 1,250,000), Celebes (72,000 square miles, population 2,000,000), Java, with the island of Madura (50,554 square miles, population 25,500,000), the Moluccas (42,420 square miles, population 400,000), part of New Guinea (151,790 square miles, population 200,000), Sumatra (149,555 square miles, population 2,979,946), and other islands in the Asiatic archipelago with about 30,000 square miles, and about 250,000 population. Besides the foregoing East Indian possessions, the Netherlands have Bonaire, Curaçao, and other West Indian islands, with about 500 square miles and about 54,000 population, and the colony of Dutch Guiana, or Surinam, with 46,060 square miles and 65,000 population. The most important towns are Batavia, Java; Amboyna, in the Moluccas; Willemstadt, in Curaçao, and Paramaribo, in Surinam. The total area is estimated at 730,000 square miles, and the total population in 1896 estimated at about 35,000,000. The government of these dependencies is in some cases directly under the home office, in others the possessions are held as vassal and tributary or confederated states. For further information on the Dutch colonies see BORNEO; JAVA; SUMATRA; DUTCH GUIANA; CELEBES; DUTCH INDIES.

Events of the Year 1899.—The event of greatest general interest during the year 1899 was the assembling of the world's peace conference at The Hague, for an account of which see the article HAGUE CONFERENCE. On July 4 a celebration was held in Delft to honor the memory of Grotius, the father of international law, who died in 1645.

NEVADA, a State of the Pacific slope, has an area of 110,700 square miles. Capital, Carson City. Nevada was admitted to the Union in 1864.

Minerology.—A number of surprises marked the mining operations of 1898. The results of the year showed that the general attention was concentrated on the three metals, gold, silver, and copper, to the complete exclusion of several minor ones which had formerly yielded profitably. The first surprise was the output of gold. This had been estimated by the United States director of the mint as likely to amount to a value of \$2,959,731. The production, however, was 144,859 fine ounces, valued at \$2,994,500. Silver fell to 805,000 fine ounces, a decrease in a year of 423,900 fine ounces, of a coining value of \$1,040,808. Probably the largest surprise was in copper, which had been fluctuating wildly in production for many years. In 1883 the output was 288,077 pounds. From that year it steadily declined till in 1893 it amounted to 20,000 pounds only. Thence, till 1898, so little attention was paid to it that standard reports contained no mention of any annual production. In 1898, however, there was an output of 437,396 pounds, the largest on record in the State, and during 1899 there was a greater activity in known and suspected copper properties than in either gold or silver. Scarcely a fortnight passed that did not see the discovery or initial working of new veins or croppings. A number of new high-grade ore bodies that came under development contained also paying quantities of gold or silver, or both, and several well-known mines that were formerly worked for gold or silver and lead were found to be rich in copper also. New gold-mining camps were established at Searchlight, Selbyville, Morrison Hill, White Pine, and Soda-ville, the last on property known to be rich in gold, silver, and copper. The work of draining the famous Comstock mines had made such progress that in October the first ore shipped therefrom in more than a year was sent out from the Belcher mine. In all, 30 carloads were shipped. Mining operations on the Comstock lode are likely to be resumed with old-time vigor, as 27 different companies have arranged with an electric power company to supply the mines with 5000 horse-power from a plant at Floriston, Cal. The line for transmitting this power, which originates in the descent of the Truckee River from Lake Tahoe to Reno, 2000 feet, was under survey at the end of the year. This cheapened power is expected to recover large quantities of low-grade ore that heretofore has not been deemed worth the excessive cost of existing power plants. No official reports on the productions of 1899 were available at the time of writing, but the director of the mint estimated the output of gold as worth \$2,442,000, and that of silver as \$1,245,800.

Railways.—The new railway construction in the calendar year 1898 amounted to 12 miles, giving the State a total mileage of 920.37.

Manufactures.—Nevada is included in the internal revenue collection district of California, and the details of its taxable manufactures are consolidated with those of that State; but the amount of collections of revenue on its manufactures of this character, in the fiscal year ending June 30, 1899, was separately reported as \$31,911.

Banks.—On October 31, 1899, there were one national bank in operation and two in liquidation. The active capital was \$82,000; circulation, \$17,132; deposits, \$425,412, and reserve, \$54,487. The State banks, June 30, 1899, numbered 3, and had capital, \$270,000; deposits, \$997,514, and resources, \$1,395,035.

Education.—At the close of the school year 1897-98, the school population was 8996; enrolment in the public schools, 7348, and average daily attendance, 4982. There were 314 teachers, 224 buildings used as school-houses, and public school property valued at \$265,011. The revenue was \$206,821; expenditure, \$203,642, of which \$162,322 was for teachers' salaries. There were 8 public high schools, with 23 secondary teachers, 509 secondary students, and 5 elementary pupils; no private secondary schools; no normal schools, and a State university, which reported 3 scholarships, 19 professors and instructors, 327 students, 6457 volumes in the library, \$17,030 invested in scientific apparatus, \$156,184 in grounds and buildings, and \$95,000 in productive funds, and \$54,878 in total income. In 1899 there were 29 periodicals, of which 9 were dailies and 17 weeklies.

Finances.—In 1898 the assessed valuations were: Real estate, \$16,364,656; personal property, \$6,822,555, and net proceeds of mines, \$330,034—total, \$23,517,245, a slight increase over the total of 1897, chiefly in personal property; state tax rate, \$9.20 per \$1000. On January 1, 1899, the total debt, exclusive of the irredeemable bond for \$380,000, was \$287,364; cash in the treasury, \$136,699; net debt, \$151,265.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 45,000, or stationary as compared with the previous year.

Legislation.—A guardianship law, looking to the care of children and insane people, and their property, was enacted. A State live stock inspector and a State board of medical examiners were created. Soldiers may vote, and United States senators may be nominated and voted for.

State Officers and National Representatives.—Governor, Reinhold Sadler; lieutenant-governor, J. R. Judge; secretary of state, Eugene Howell; treasurer, D. M.

Ryan; comptroller, S. P. Davis; superintendent of public instruction, Orvis Ring; adjutant-general, J. R. Judge, *ex officio*; attorney-general, W. D. Jones. Supreme Court: Chief justice, M. S. Bonnifield; justices, W. A. Massey, C. H. Belknap; clerk, *ex officio*, Eugene Howell. The State legislature consists of 14 Republicans, 2 Democrats, 26 Silverites, and 3 Independents. Senators, John P. Jones (Sil. Rep.), from Gold Hill, and William M. Stewart (Sil. Rep.), from Virginia City. Representative, F. G. Newlands (Sil.), from Reno.

NEW BRUNSWICK, a province of the Dominion of Canada, with an area of 28,200 square miles, exclusive of the territorial seas; capital, Fredericton.

Industries.—The principal industries continue to be those connected with the fisheries, although reports for 1898 indicate a renewal of activity in other lines. The value of the total fishery catch in the calendar year 1897 (the last officially reported) was \$3,934,135; principal catch, herring, \$1,070,714; lobsters, \$592,956; smelts, \$363,917; sardines, \$352,276; cod, \$327,272, and salmon, \$275,896; exports of all fisheries (1898), \$677,624; distribution of fry, 4,847,000, and capital invested in all fisheries, \$1,755,324. Agricultural returns for 1898 showed the following crops: Oats, 4,971,019 bushels; potatoes, 4,954,510; buckwheat, 1,658,207; wheat, 409,943; barley, 108,967, and hay, 546,932 tons. The area devoted to these crops was 834,659 acres. Coal was mined in the year to the extent of 6100 tons, a slight increase over the output of the previous year, and the province imported 74,109 tons, and exported 7936 tons. New Brunswick is one of three provinces only in which gypsum deposits are now worked, and in 1897 it was the second largest producer, with an output of 82,658 tons, valued at \$118,116.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise aggregated in value \$4,925,662; exports, domestic and foreign, \$11,166,218, an increase in a year of \$1,581,236; duty collected, \$917,676. The registered tonnage of British, Canadian, and foreign vessels carrying cargoes in and out of the province was 1,215,698, and of all vessels in the coasting trade, 1,375,419. Navigation along the coast was facilitated by 93 light-stations, 117 light-houses, 8 fog-horns, 4 fog-whistles, and a light-ship. The registered merchant marine of the province comprised 117 steamers of 9858 gross tonnage, and 786 sailing vessels of 79,399 gross tonnage.

Banks.—On January 1, 1899, there were 30 chartered bank branches in the province, and during the previous year the exchanges at the clearing house in St. John amounted to \$30,349,264, a small decrease from the total of 1897. There were also 45 post-office savings banks, with 7012 depositors, and \$2,421,557 deposits, and 5 government savings banks, with 15,853 depositors, and \$6,111,750 deposits.

Railways and Telegraphs.—On June 30, 1898, the total length of railways in operation was 1447 miles, and the provincial and municipal grants to roads constructed and under construction then amounted to nearly \$5,000,000. Government telegraphs, consisting principally of the Bay of Fundy system, had a total length of 76 miles of land lines and 10¼ miles of cables, with 8 offices, and revenue, \$869; expenditure, \$3799.

Post-Offices.—At the end of 1898 there were 1182 post-offices in the province, in which were posted during the year 6,750,000 letters and 1,215,000 postal cards; and 127 money-order offices, which issued 66,929 orders.

Education.—At the close of the term ending June 30, 1898, the province had 1778 public schools, with 1864 teachers, 63,333 enrolled pupils, and 38,874 pupils in average attendance. The grammar schools had 28 teachers and 862 pupils, and the normal schools, 281 students, of whom 227 were females. The receipts were, from government grant, \$188,104; municipal appropriations, \$90,807, and district assessments, \$230,000—total, \$508,911, and expenditures, \$483,829. At the end of 1899 there were 46 periodicals, of which 9 were dailies and 26 weeklies.

Finances.—The revenue of the province in the year ending December 31, 1898, was \$708,809; expenditure, \$727,050; gross debt (October 31, 1898), \$3,198,859; Dominion government debt allowance, \$530,402; other assets, \$46,590—total assets, \$576,992. Besides these assets the province had public buildings valued at \$370,000, and about 7,000,000 acres of crown lands held at \$1 per acre.

Population.—Local estimates in 1898-99 gave St. John, 42,000; Moncton, 10,000; Fredericton, 7000; Chatham, 6000; Sackville, 5000; Woodstock, 3400, and St. Stephen, 2700. The Indian population of the province was 1627. There were 6 schools for Indian youth, which had an enrolment of 145, and an average attendance of 71. The Indians cultivated 1323 acres of land, had 280 head of live stock, and received \$22,425 from their fish, furs, and other industries.

NEWEL, STANFORD, A.M., United States minister to the Netherlands, was appointed by President McKinley a member of the American delegation at the peace conference, which met at The Hague in May, 1899. The appointment of the delegation was announced by Secretary of State Hay on April 6, 1899. Mr. Newel was

born in Providence, R. I., June 7, 1839; in May, 1855, he removed to St. Anthony's Falls, Minn. He was graduated at Yale in 1861, and at the Harvard Law School in 1864, in which year he began the practice of his profession in St. Paul, and has since that time been a resident of the city. He gained prominence as a lawyer and has been active in politics, having been chairman of the State Republican committee, and in 1888 and 1892 a delegate to the Republican national convention; but, excepting a few years, when he held an unpaid membership in the St. Paul Park Board, he never held public office until May, 1897, when he was appointed by President McKinley minister at The Hague.

NEW ENGLAND SOCIETY, founded in 1805, and incorporated in 1833, had in 1899, 1504 members. Annual meetings of the society are held in December. President, William E. Dodge; secretary, George Wilson, 32 Nassau Street, New York City.

NEWFOUNDLAND, a British colony in North America, comprising the island of that name, and the coast region of Labrador; area, island, 42,734 square miles; Labrador, dependency, about 120,000 square miles; capital, St. John's.

Industries.—The distinctive industries of the colony have been for generations those connected with fisheries; but the completion of the great railway between St. John's and Port-au-Basques (see *INTERNATIONAL YEAR BOOK* for 1898, title *NEWFOUNDLAND*) has already opened a new era to the colony and led to the organization of influential movements for the development of other industries, particularly in the line of mineralogy. An expert geological examination of Smith and Random Sounds and Random Island, on the west side of Trinity Bay, during the summer of 1899, disclosed the existence of one of the great roofing-slate deposits of the world, comparable with the well-known deposits in Wales, New York, and Vermont. This slate is of the green species, and has been quarried at one point on Smith Sound for many years, for purely local uses; but till 1899 there has never been even an approximate knowledge of the vast extent of the deposits. The value of the discovery is greatly enhanced by the fact that the largest ships can load on Smith Sound directly from quarries, thus reducing the cost of transportation to markets. A syndicate was organized later in the year to develop this industry. During the year a syndicate of Nova Scotia capitalists, which had acquired the newly developed hematite mines on Great Belle Isle, in Conception Bay, sold a part of the tract to the Whitney syndicate of Boston, Montreal, and Halifax, for \$1,000,000. The ore is found in blocks, and may be easily and cheaply handled direct from mine to steamer. Already a considerable quantity of this ore is being shipped to the great Krupp foundries at Essen, Prussia, and in the coming season this property will be the chief source of supply for the large steel plant begun at Sydney, Cape Breton, in 1899. The railway has stimulated surveys for other mineral properties in localities previously difficult of access, and considerable experimental developing was undertaken during the year.

Fisheries.—Both the cod and the lobster fisheries continue to show a decline, chiefly attributable to the vexatious "French shore question." In the season of 1898 the fisheries of the "banks" region employed 66 vessels and 872 men, and had a catch of cod equal to 58,762 quintals. Sealing employed 19 steamers and 4838 men, and had a catch of 243,014 seals, worth about \$607,535. All fisheries yielded a catch valued at \$4,571,808. The colonial government maintains an admirable hatchery in Trinity Bay, and in the summer of 1899 the waters of the bay as well as those along the coast were swarming with young cod. Operations on the Labrador "banks" in the season of 1899 were almost an absolute failure. So small was the catch of cod, the mainstay of the people, that the inhabitants were without funds to purchase supplies for the winter, and, without government aid, starvation seemed imminent in many places. An experimental steam whaler caught 91 whales in less than four months in 1898, earning \$22,000. There is a factory for the extraction of oil on Hermitage Bay, and a second one is being erected.

Commerce.—The total imports of the colony in 1897 amounted to \$5,938,336; exports, \$4,925,786. In 1898 Newfoundland imported from the Canadian provinces to the amount of \$2,170,518, and exported thereto, principally fish and fish products, \$464,560; and imported from the United States to the amount of \$1,175,733, and exported thereto, \$372,115. In that year the entrances of British, Canadian, and foreign vessels at local ports aggregated 840, of 179,850 registered tonnage, and the clearances, 991, of 222,508 tonnage. During the year ending June 30, 1899, the colony imported from the United States merchandise valued at \$1,595,495, and exported thereto domestic products valued at \$383,168. The registered merchant marine of the colony in 1898 comprised a total of 2363 vessels (35 steamers), of 106,118 tons.

Railway and Telegraph.—The colonial railway has a total length of 633 miles, and is connected with the railway system of Canada by a steamer plying between Port-

au-Basques and the mainland at Cape Breton. Government telegraphs have a total length of 1500 miles.

Finances.—In 1897 the revenue was \$1,610,789; expenditure, \$1,804,847, and public debt, \$16,639,946.

Population.—In 1898 the population of the island and the Labrador dependency was estimated at 208,000, exclusive of Indians; St. John's, 29,000; Trinity, 17,300; Harbor Grace, 6500; Carbonear, 4120; Twillingate, 3580; Bonavista, 3550.

French Shore Question.—The close of the year 1899 left the French shore question still unsettled, and it seemed likely to assume a more acute phase in the future than ever before since the Newfoundland legislature adjourned in the summer of 1899 without providing for a renewal of the *modus vivendi* in regard to the lobster industry, which was to expire on December 31, 1899. The history of this question may be recapitulated as follows: The treaty of Utrecht (1713), which was confirmed by the treaties of Paris (1763) and Versailles (1783), gave to France the right of fishing on the western and northeastern coasts of Newfoundland during the season and of drying the catch on a narrow strip of territory along that coast. It gave them the privilege of building temporary structures for the purpose and of procuring wood for these buildings from the forests. According to the Newfoundland view of the question, the right to fish was an exclusive one, and did not imply any territorial jurisdiction. The Newfoundlanders appealed to the interpretation of the treaties as evidenced by the policy of Great Britain down to 1820. During this period the view of Great Britain appeared to be that the sole right of the French in the region was that of catching and drying fish during the season. On the other hand, the French have declared that the right of France to the Newfoundland coast is only a part of her ancient sovereignty over the island, and in 1891 the French government definitely stated that no offers of purchase would be entertained, since the exercise of these rights on the Newfoundland coast was essential to a class of French citizens who had been depending for years upon this industry as a means of earning a livelihood. The colonists declared that the French claims had been greatly extended in recent years, and that recognition of them in their present form would check the industry and development of the entire region. These claims had been so strictly interpreted that no colonist was allowed to build a house, shed, wharf, or structure of any kind within the conceded area. Important industries like mining, lumbering, and pulp-making were completely checked, and the opening up of the country was prevented by the refusal of the French to allow a railway or tramway to be laid in the region. They accused the imperial government of weakness and apathy in the matter. In 1898, however, a royal commission having investigated the question, Mr. Chamberlain took a firm stand on behalf of the rights of the colonists, saying that by means of alleged rights under antiquated treaties the French had strangled the colony of Newfoundland. The crucial point in the dispute was the question whether the word fish meant cod, which was its local significance, and whether drying fish and the temporary structures necessary thereto was to be so widely interpreted as to include the canning of lobsters by the French in permanent buildings. In the colony it is contended that the French have a right to catch and dry cod only. The canning of lobsters was introduced in the treaty coast by the natives, and the French did not compete in the industry until a few years ago. As late as 1886 a French station owner on the coast was prohibited by the French commodore from exercising the right of canning lobsters. Another alleged injustice was the fact that the French fishermen were underselling the natives in the fish markets by reason of the bounties granted to them by the French government. In 1887 the colonial government prohibited the sale of bait to the French fishermen. This measure was vetoed by the colonial office, but was re-enacted the next year and finally sanctioned. Thereupon the French retaliated by bestowing a special bounty on the lobster canning industry and by demanding the removal of the colonial canning establishments. The opposition of the colonial government to the latter demand was not supported by the imperial authorities, but in 1890 a *modus vivendi*, renewable each year, was concluded between the British and French governments, providing for the reference of the lobster dispute to arbitration. From 1890 to December 31, 1899, the status of the lobster industry has been determined by this *modus vivendi*. The colonists complained that the *modus vivendi* established a monopoly of the industry by parcelling out the treaty shore among forty-five colonial and fifteen French factory owners. The settlers on the treaty coast were allowed only to trap lobsters and sell them to the monopolists, who practically could fix their own prices. The British war-ships kept a sharp lookout on illicit lobster canning, and offences were punished with severity. The hardships which this course entailed upon the natives caused a vigorous protest. It was said that the people of the coast were not allowed to sell bait to any one else until they had first supplied the French fishing schooners at a price far lower than what they otherwise could have obtained. The royal commission of 1898 presented its report to Mr. Chamber-

lain in March, 1899. The latter allowed the Newfoundland legislature to close its session without calling upon it for the renewal of the *modus vivendi*. This led the colonists to expect some definite action on their behalf, and there were signs that the French might be willing to come to a favorable arrangement. In 1899 the French had only 15 stations along the 800 miles of coast, and their industries had been comparatively unsuccessful. The number of visiting fishermen was said to be declining, and in France itself suggestions were made that the cession of their rights on the coast might be to their own advantage. The withdrawal of the *modus vivendi* would remove the restraints which during the decade have been imposed upon the colonists, and it was thought that unless some new arrangement were made the French might encounter difficulties in the course of the following season. In March, 1899, an attempt was made to bring about a crisis by burning a French lobster factory, but nothing came of this, and, on the whole, the people showed a law-abiding spirit. One of the considerations that have influenced the French in this matter has been the belief that the subsidizing of this industry supplied the French navy with trained seamen, but some of the leading naval authorities in France declared that the existence of the French shore made no difference to the navy. The expense to France of this heavy subsidization of the fisheries has been nearly 300,000,000 francs in the past twenty-five years. About \$250 has been given for every one of the 12,000 men employed. The colonists struck a heavy blow at the industry by the passage of their Bait act, but the proximity of the French settlement of St. Pierre to some extent modified its effect, since bait carriers found a profitable trade there, and were encouraged, it is said, to carry back cargoes of contraband goods to be smuggled into the colony. It was suggested in 1899 that the way out of the difficulty would be for England to prevent the French from taking lobsters, herring, or salmon, and from interfering with the natives or with the internal developments of Newfoundland. In other words, it was the view of the colonists that the French should be held to a strict interpretation of their treaty rights—an interpretation which there is nothing in the recent course of their diplomacy to indicate that they would accept.

NEW GUINEA, or PAPUA, is, if Australia be considered a continent, the largest island in the world, being nearly 1500 miles long and about 430 miles across at its greatest breadth, and embracing an area of about 313,000 square miles. New Guinea is apportioned between three European powers, the respective territories of which are known as British Guinea, Kaiser Wilhelm's Land, and Dutch Guinea. The latter comprises about one-half the island, the other half having been independent until 1884, when it was divided between England and Germany. From the protectorate thus established England erected a colony in 1888, and Germany, after leaving her portion for many years under the administration of the German New Guinea Company and an imperial commissioner, placed it in the year 1899 under more immediate protectorate control. Dutch New Guinea, with an area of 154,789 square miles, while the most important of the three divisions in extent, is surpassed by British Guinea in some ways. Its population is 200,000, and in government it belongs to the Dutch Indies system, and is administered by a Resident at Ternate. From the standpoint of population and natural resources, by far the most important section of the island is British Guinea. The latter has an area of only 88,460 square miles, about one-half that of Dutch Guinea, but the population is 350,000, or nearly twice as great as the population of the Dutch possessions. As to productiveness, there is said to be an abundance of good timber and valuable forest products. At present the chief exports are trepang, pearl-shell, copra, gold, sandal-wood, and pearls. The country is being gradually settled and the natives trained. In the work of educating and subduing the natives great credit is due the missionaries. It is hoped that the colony may become self-supporting by 1902, and thus allow the suspension of the annual guarantee of £15,000, which is granted by the colonies of Queensland, New South Wales, and Victoria to cover the expenses of administration, in which these colonies have some share. The territory is administered as a crown colony, the governor residing at Port Moresby. The area of Kaiser Wilhelm's Land is about 70,000 square miles, and its population about 110,000. Its chief products are areca, cabinet woods, live stock, and, in particular, tobacco. Gold also has recently been discovered. Some outlying islands are included in British Guinea, and the Bismarck archipelago belongs to the German colony. It was reported in November, 1899, that civil war had broken out among the native tribes of New Guinea.

NEW HAMPSHIRE, a New England State, has an area of 9305 square miles. Capital, Concord.

Mineralogy.—The granite output of 1898 reached a value of \$683,595, an increase in a year of \$41,904, and the largest in five years. Thus, a steady improvement is apparent in both building and monumental stocks, in both of which the State is rich in variety and quantity.

Manufactures.—The internal revenue collection district of New Hampshire also includes the States of Maine and Vermont. In the fiscal year ending June 30, 1899, the collections of revenue on taxable manufactures aggregated \$1,341,036 for the district and \$797,956 for New Hampshire alone. The district had 8 manufactories of tobacco and 196 of cigars, and the combined output in the calendar year 1898 was 14,707,277 cigars for the district and 7,631,615 for New Hampshire alone, and 4972 pounds of smoking tobacco. The total production of fermented liquors was 301,823 barrels. The general prosperity of the cotton industry in the season of 1898-99 was indicated in the annual reports to the stockholders by the officers of the Amoskeag, Stark, and Amory mills in Manchester. The Amoskeag plant produced 109,833,769 yards of cloth and 2,029,867 bags, and had a net profit for the year of \$440,862; the Stark had an increased production of 1,921,899 pounds and earnings of \$213,567; and the Amory had an increased output of bleached goods of 264,000 yards, paid its usual dividends, and had a net profit of \$94,000. All stocks of goods that had accumulated during the long depression were sold out, and all mills reported an inability to manufacture fast enough to supply the demands.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the port of Portsmouth aggregated in value \$17,014, a slight decrease from the total of the previous year; exports, none.

Railways.—There was no new railway construction of importance in either 1898 or 1899, and the present total mileage is 1174.61.

Banks.—On October 31, 1899, there were 52 national banks in operation and 11 in liquidation. The active capital aggregated \$5,400,000; circulation, \$3,769,504; deposits, \$13,582,039; and reserve, \$4,440,034. The State banks, June 30, 1899, numbered 9, and had capital, \$560,000; deposits, \$1,056,895; and resources, \$1,922,703; and the mutual savings banks, 52, with depositors, 133,174; deposits, \$52,131,879; resources, \$59,750,245; and surplus and profits, \$4,124,734.

Education.—At the close of the school year 1897-98 there were 52 public high schools, with 145 secondary teachers, 3325 secondary students, and 544 elementary pupils; 29 private secondary schools, with 159 secondary teachers, 2018 secondary students, and 2200 elementary pupils; and a State normal school, with 14 teachers and 340 students in all departments. Two colleges for men and for both sexes reported 200 scholarships; 64 professors and instructors, 691 students, 80,000 volumes in the libraries, \$102,000 invested in scientific apparatus, \$650,000 in grounds and buildings, and \$1,500,000 in productive funds; \$107,000 in total income and \$156,200 in benefactions. The legislature of 1899 made provision for equalizing the school privileges of the cities and towns by appropriating \$25,000 annually, 25 per cent. of this to be used to aid supervisory districts in hiring superintendents of schools, the State paying one-half of the salaries, and 75 per cent. to be distributed among cities and towns in which the equalized valuation is less than \$3000 for each child in average daily attendance in the public schools. Beginning with the year 1900 cities and towns wishing this aid must maintain not less than 20 weeks of school per year. Under the main provision, 41 towns fell below the \$3000 per child valuation in the school year 1899-1900, and the governor and council added 21 other towns, making a total of 62 towns, to whom \$18,750 was distributed. The remainder of the appropriation was held in the State treasury, no supervisory districts, as defined in the law, having been formed at the time of writing. In 1899 there were 109 periodicals, of which 14 were dailies, 77 weeklies, and 12 monthlies.

Finances.—The assessed valuations aggregated \$252,490,075 in 1898 and \$208,173,709 in 1899. The funded debt, June 1, 1899, was \$1,289,800; trust funds, \$734,749; floating debt, \$1472—total debt, \$2,026,021; assets, \$690,953—net debt, \$1,335,068.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 396,000.

Legislation.—Deposit books must be verified at the banks at least once in four years. Making or repairing tools known to be used for burglary constitutes a crime. The State and the national flag must not be desecrated. Those who consider themselves unfit to care for their property on account of age or infirmity may apply for the appointment of guardians. In the interests of health, plumbers and embalmers are to be examined and licensed, street cars are to enclose their platforms, and candy must not be adulterated. A law was passed prescribing the manner of sale of all liquors in the State, and the governor is to appoint a State liquor agent, from whom all liquors shall be bought by the liquor agents appointed by city and town authorities. All statutes giving any portion of a fine or penalty to those prosecuting or complaining were repealed. The question of holding a constitutional convention will be submitted to the vote of the people at the November election in 1900.

State Officers and National Representatives.—Governor, Frank W. Rollins; secretary of state, Edward N. Pearson; treasurer, Solon A. Carter; adjutant-general, A. D. Ayling; attorney-general, Edwin G. Eastman. Supreme Court: Chief justice, Isaac N. Blodgett; associate justices, William M. Chase, Frank N. Parsons, Robert G.

Pike, R. R. Wallace, Robert J. Peaslee, John E. Young; clerk, A. J. Shurtleff. The State legislature consists of 273 Republicans and 111 Democrats. Senators, Jacob H. Gallinger and William E. Chandler—both Republicans from Concord. Representatives, Cyrus A. Sulloway, from Manchester, and Frank G. Clarke, from Petersboro—both Republicans.

NEW JERSEY, a Middle Atlantic State, has an area of 7815 square miles. Capital, Trenton.

Mineralogy.—A revival, quite general and somewhat unexpected, has taken place in the iron industry of this State. The largest production of its mines in the days of the greatest prosperity was about 600,000 long tons. From that amount the production gradually declined to about one-third or even less. In 1898, the output, all of magnetite, rose to 275,438 long tons, valued at \$654,148, an increase in a year of 21,203 tons. During that year and the early part of 1899, a large amount of capital was put into the iron properties, and mines were reopened and furnaces put into blast, with the result that at the close of 1899 every iron furnace in Passaic, Morris, Sussex, and Warren Counties, were either in blast or getting ready to go into blast. Ore is mined in all these counties, Morris producing more than any of the others. A manganiferous zinc residuum, used in the manufacture of spiegeleisen, is obtained at the zinc mines in the northern part of the State, and of this there was a production in 1898 of 48,502 long tons, valued at \$26,676, the only output of its kind in the country. The boom in copper in 1899 again directed the attention of capitalists to the long-disused copper mine on the Arlington ridge, immediately west of the Hackensack meadows. This mine was once an exceedingly valuable property, because of the unusual purity of the metal. The bottom of the shaft is below tide-water, and for many years there has been no persistent working, owing to the necessity for costly methods of keeping the water out. Late in 1899 new blood and capital were interested in the property, and measures were undertaken for the recovery of the great mass of copper the mine is known to contain. Quarrying in 1898 yielded granite to the value of \$753,513; sandstone, \$257,217; slate, \$800; and limestone, \$146,611—total, \$1,158,141. In the summer of 1899 Thomas A. Edison began prospecting on the ridge which forms the foothills of the Pohatcong Mountains, near Stewartsville, which contain a practically inexhaustible body of cement rock and limestone. Acquiring options on 1800 acres of land, he began prospecting, and found sufficient cement rock, exclusive of limestone, to warrant the organization of a company, and the preparation of a plant, which, it is claimed, will be the largest cement mill in the country. Early in 1900 Mr. Edison expected to be turning out from 5000 to 7000 barrels of cement daily. See TRIASSIC.

Manufactures.—During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$8,074,261. There were 64 manufacturers of tobacco and 1033 of cigars, and the combined output in the calendar year 1898 was 70,280,328 cigars, 488,450 cigarettes, 5,388,150 pounds of plug tobacco, 2,248,223 pounds of fine cut, 6,167,407 pounds of smoking, and 5,107,941 pounds of snuff. Grain and fruit distilleries in operation numbered 47; the amount of fruit brandy produced was 38,638 gallons; spirits rectified, 365,891 gallons; distilled spirits gauged, 1,638,263 gallons; and fermented liquors produced, 2,043,999 barrels. The chief of the State Bureau of Statistics of Labor, in his report for 1899, shows that out of nearly 10,000 industrial concerns in the State only 1464 submitted reports, owing to an impression that seems to prevail among some manufacturers that the purpose of the bureau is to assist legislation favorable to labor and antagonistic to capital. The reports submitted, however, cover all the large industries of the State, and show capital invested, \$196,798,843; persons employed, 147,604; paid for wages, \$56,509,382; paid for materials used, \$313,480,197, and selling price of combined output, \$264,274,214. In the silk industry the State leads all others in investment and product. The capital investment exceeds \$20,000,000; persons employed, 26,000; wages paid, \$10,650,789; and value of output, \$42,570,690, nearly double that of ten years ago. The higher grades of silks are now made almost exclusively in this State. (See SILK MANUFACTURES.) During 1898 the production of pig-iron was 100,681 long tons, an increase in a year of nearly 5000 tons, and of all kinds of rolled iron and steel, 98,281 long tons.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Bridgeton, Newark, and Perth Amboy aggregated in value \$635,175; exports, \$1,824,378; imports of gold and silver, \$1,472,018; exports, none; total foreign trade of the year, \$3,931,571, net increase in a year, \$21,770. As the large foreign trade at Jersey City is credited wholly to the port of New York, the manufacturers and others of Jersey City have petitioned Congress to constitute that city an independent port of entry and clearance.

Railways.—The new railway construction in the calendar year 1898 amounted to 7.22 miles, and in 1899 to 9.50 miles, giving the State a total mileage of 2252.52. The assessment of railroad and canal property, principally the former, in 1899 was

\$224,284,792, an increase in a year of \$1,867,044, and on this the railways will pay \$1,121,423 to the State and \$423,019 to the municipalities in which their property is situated.

Banks.—On October 31, 1899, there were 108 national banks in operation and 14 in liquidation. The active capital aggregated \$14,729,025; circulation, \$5,860,421; deposits, \$72,083,392, and reserve, \$20,307,327. The State banks, June 30, 1899, numbered 21, and had capital, \$1,753,000; deposits, \$8,541,779; and resources, \$12,103,321; loan and trust companies, 24, with capital, \$3,074,300; deposits, \$32,520,843; and resources, \$39,795,207; and mutual savings banks, 26, with depositors, 189,674; deposits, \$52,120,644; resources, \$57,403,925; and surplus, \$5,131,835.

Education.—At the close of the school year 1897-98 the school population was 466,714; enrolment in the public schools, 304,680; and average daily attendance, 200,278. There were 6276 teachers, 1850 buildings used as school-houses, and public school property valued at \$14,601,840. The revenue was \$5,757,679; expenditure, \$5,723,424, of which \$3,556,163 was for teachers' salaries. There were 85 public high schools, with 414 secondary teachers, 9690 secondary students, and 254 elementary pupils; 70 private secondary schools, with 386 secondary teachers, 3683 secondary students, and 3139 elementary pupils; and 3 public normal schools, with 72 teachers and 2005 students in all departments. Normal training was also given in 1 college and 10 public high schools. Four universities and colleges for men and for both sexes reported 12 fellowships, 105 scholarships, 145 professors and instructors, 1601 students, 186,762 volumes in the libraries, valued at \$176,200; \$570,000 invested in scientific apparatus, \$2,525,000 in grounds and buildings, and \$3,500,000 in productive funds; \$489,499 in total income and \$4000 in benefactions. One college for women reported 16 professors and instructors, 68 students, and \$12,000 income; and 2 schools of technology, 19 scholarships, 40 professors and instructors, 595 students, \$55,000 in scientific apparatus, \$407,000 in grounds and buildings, \$475,000 in productive funds, and \$67,423 income. During 1899 the State expended \$6,476,983 on public education, 6191 teachers were employed, the number of school buildings was 1887, total value of public school property, \$15,846,123, and the public school enrolment, 315,055. The total apportionment of State school money for the fiscal year beginning July 1, 1899, was \$2,533,550, based on the school census of 1898, 466,714. In 1899 there were 392 periodicals, of which 48 were dailies, 291 weeklies, and 41 monthlies.

Finances.—The assessed valuations in 1899 were: Real estate, \$758,570,962; personal property, \$141,747,356—total, less deductions for debts, \$866,029,771, an increase in a year of \$21,664,573; special railroad assessment, \$224,284,792. The income of the State fund in the year ending October 31, 1899, was \$3,049,700; ordinary disbursements, \$2,019,364; extraordinary disbursements, \$778,706. The balance on hand, November 1, 1898, was \$1,001,524; receipts during the fiscal year, \$3,049,700; disbursements, \$2,789,071; balance, October 31, 1899, \$1,253,153. During the fiscal year 1898-99 the number of companies incorporated under State laws was 1945, and the State received \$728,023 in fees. The total number of companies incorporated in the State on which the annual franchise tax was levied in 1899 was 2885, of which 2734 were capitalized at \$1,454,457,000. The tax aggregated \$901,277. The State bonded debt, October 31, 1899, was \$71,000, the last of the bonds issued on account of the Civil War expenses, which fall due January 1, 1902.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 1,890,000.

Legislation.—Laws were passed regulating assignments for the benefit of creditors and the incorporation of banks, trust companies, and safe deposit companies; a State board of children's guardians was created, with large powers over indigent, helpless, dependent, abandoned, friendless, and poor children who become public charges; policemen cannot be removed, except for cause, when disabled they are to be pensioned, and after their death their widows and minor children are to receive pensions; to take electric power illegally for light, heat, or power was made a misdemeanor, punishable by fine and imprisonment. A State sewage commission was created, with power to prevent the pollution of streams, create sewage districts, and authorize the construction of sewers by condemnation proceedings and assessments upon municipalities. The Board of Health has further power as to pollution of water, and may sue for penalties, or enjoin. Horses are recognized as proper human food, after inspection, but when slaughtered and offered for sale the meat must be labelled "horse flesh." Laborers not engaged in agricultural pursuits, or water-men, must be paid their wages every two weeks, and agreements to the contrary are void. Only citizens of the United States can be employed by public authorities or on public work. Extra pay and medals were voted to volunteers in the Spanish war, a monument to those who lost their lives on the *Maine*, and a sword to Admiral Sampson. See PAVEMENTS AND ROADS.

State Officers and National Representatives.—Governor, Foster M. Voorhees; secretary of state, George Wurts; treasurer, G. B. Swain; comptroller, W. S.

Hancock; attorney-general, Samuel H. Gray; adjutant-general, W. S. Stryker; superintendent of education, C. J. Baxter; commissioner of banking and insurance, William Bettle. Supreme Court: Chief justice, W. J. Magie; associate justices, D. A. Depue, J. Dixon, B. Vansyckel, C. G. Garrison, J. H. Lippincott, W. S. Gummere, G. C. Ludlow, Gilbert Collins; clerk, William Riker, Jr. The State legislature consists of 58 Republicans and 23 Democrats. Senators, William J. Sewell, from Camden, and John Kean, from Elizabeth—both Republicans. Representatives, H. C. Loudenslager (Rep.), from Paulsboro; John J. Gardner (Rep.), from Atlantic City; B. F. Howell (Rep.), from New Brunswick; J. S. Salmon, Jr. (Dem.), from Boonton; James F. Stewart (Rep.), from Paterson; Richard W. Parker (Rep.), from Newark; William D. Daly (Dem.), from Hoboken; Charles N. Fowler (Rep.), from Elizabeth.

NEWMAN, JOHN PHILIP, D.D., a bishop of the Methodist Episcopal Church, and a well-known pulpit orator, died at Saratoga, N. Y., July 5, 1899. He was born in New York City, September 1, 1826; was educated at Cazenovia Seminary; studied theology, and entered the Methodist ministry in 1849. He held pastorates in the Oneida and Troy conferences, and in 1858 was assigned to the Bedford Street Church in New York. In 1860-61 he travelled in Europe and Palestine. From 1864 to 1869 he was for most of the time in New Orleans; during this time he was actively engaged in reorganizing the Methodist Church of the South, and succeeded in establishing three annual conferences, two colleges, and a church paper. In 1869 he was called to Washington, where he organized and became pastor of the Metropolitan Memorial Church. President Grant and Chief Justice Chase were members of the congregation. From 1869 to 1874 he was chaplain of the United States Senate. President Grant appointed him in the latter year inspector of American consulates in Asia. Two years later he returned to his former charge in Washington, where he remained until 1878. He was then successively pastor of the Central Methodist Church and the Madison Avenue Congregational Church in New York, after which he went to California, and from 1885 to 1888 was for the third time pastor of the Metropolitan Church in Washington. He was elected a bishop in 1888. Dr. Newman delivered the funeral oration on General Grant in 1885, and on General John A. Logan in 1887. He wrote: *From Dan to Beersheba*, 1864; *Thrones and Palaces of Babylon and Nineveh*, 1875; *Christianity Triumphant*, 1884; *Evenings with the Prophets on the Lost Empires*; *America for Americans*, 1887; *The Supremacy of Law*.

NEW MEXICO, a southwestern Territory of the United States, has an area of 122,580 square miles. Capital, Santa Fé.

Mineralogy.—Contrary to expectations, the gold output during 1898 exceeded the estimate (\$360,000). The production was 26,074 fine ounces, valued at \$539,000. Silver showed a decline during the year, the output of silver having a coining value of \$549,883, making the total value of these metals \$1,088,883, a net increase of \$34,848. Coal from 16 mines in the calendar year 1898 yielded 992,288 short tons, valued at \$1,344,750, an increase in a year of 275,307 tons; and from 25 mines in the fiscal year ending June 30, 1899, 1,049,034 tons, valued at \$1,600,588, an increase of 100,451 tons over the production of the previous fiscal year. The coking industry in 1898 was represented by 3 plants, with 190 ovens, which used 12,557 short tons of coal and produced 6980 short tons of coke, valued at \$14,625. New Mexico shared generously in the remarkable appreciation in copper properties; but although the output of 1898 (1,592,371 pounds) was more than double that of 1897 (701,892), it was far short of the record-breaking year 1896 (2,701,664). The Territory has upward of 80 mining districts, which are widely distributed, showing that the mineral wealth is not confined to any one section. The known mineral resources include nearly every species of economic value, from salt and sulphur up to gold and silver and precious stones; and while there are numerous paying mines, none of them may be said to be well developed so far. An influx of capital would soon reveal New Mexico as one of the richest mineral-producing regions of the Rocky Mountain range. The mineral area already more or less developed equals 30,000 square miles, and there is large wealth in iron, lead, gypsum, and minor minerals, that only awaits intelligent development.

Agriculture.—The improved systems of irrigation, on which New Mexico has to depend for the enlargement of her useful land area, are developing rapidly, but there are still many opportunities for the investment of capital in profitable irrigation projects. Four large systems are now in operation—the Springer, with 50 miles of ditches and 5 reservoirs, covering 22,000 acres; the Vermejo, with 57 miles of ditches and 10 reservoirs, supplying 30,000 acres; a system in the northwestern part of the Territory, with 200 miles of ditches, supplying 24,000 acres; and an extensive one in the Mimbres region of Grant County. These systems are in the four corners of the Territory. In the great central portion more than 50 companies have been

organized for irrigation projects, and several have plants in operation. It is interesting to note here that there are nearly 57,000,000 acres of unappropriated public land in the Territory, and that agricultural public land is subject to entry only under the Homestead and Desert-Land laws. In horticulture, it is believed, New Mexico will find her greatest development. The best agricultural crop at present is alfalfa, which may be cut three and four times each season. Vegetables of all kinds yield abundantly. Experiments in sugar-beet growing in the Pecos Valley have yielded such encouraging results that a sugar factory has been established in Carlsbad, with a capacity of 200 tons of beets per day. There are now owned in the Territory over 4,000,000 head of sheep, and the wool clip in 1898-99 exceeded 18,000,000 pounds, worth from 12 to 15 cents per pound.

Manufactures.—The internal revenue collection district of New Mexico includes also the Territory of Arizona. In the fiscal year ending June 30, 1899, the collections of revenue on taxable manufactures in New Mexico alone aggregated \$66,932. There were 3 tobacco and 5 cigar factories, with a combined output in the calendar year 1898 of 353,045 cigars and 7650 pounds of smoking tobacco.

Railways.—The new railway construction during the calendar year 1898 was 159.21 miles, and during 1899, 137.70 miles, giving the Territory a total mileage of 1750.64. The entire mileage is owned and operated by 11 corporations.

Banks.—On October 31, 1899, there were 7 national banks in operation and 9 in liquidation. The active capital aggregated \$650,000; circulation, \$407,923; deposits, \$3,421,170; and reserve, \$1,006,287. Territorial banks, June 30, 1899, numbered 7, and had capital, \$272,400; deposits, \$1,145,347; and resources, \$1,471,177. No savings bank was reported.

Education.—At the close of the school year 1897-98 the school population was 50,667; enrolment in the public schools, 26,484; and average daily attendance, 16,950. There were 603 teachers, 548 public schools, and public school property valued at \$281,000. The revenue was \$203,219; expenditure, \$154,532, of which \$122,729 was for teachers' salaries. There were 4 public high schools, with 7 secondary teachers, 127 secondary students, and 25 elementary pupils; 3 private secondary schools, with 8 secondary teachers, 75 secondary students, and 221 elementary pupils; and a public normal school, with 5 teachers and 66 students in all departments. There were also the University of New Mexico, at Albuquerque; Agricultural College, at Las Cruces, with branches at Las Vegas and Aztec; School of Mines, at Socorro; Normal University, at Las Vegas; Military Institute, at Roswell; and School for the Deaf, Dumb, and Blind, at Santa Fé. The value of property embraced in these institutions is \$191,025. The Roman Catholic Church maintains 18 sectarian schools, with 72 teachers, 1602 pupils, and property worth \$231,700; the Methodist Episcopal, 11, with 462 pupils, and school property, \$10,000; the Presbyterian, 25, with 25 teachers, 1105 pupils, and school property, \$37,900; and the New West Educational Commission, 5, with 7 teachers, 219 pupils, and school property, \$44,000. The federal government maintains non-reservation Indian schools at Albuquerque and Santa Fé. 2 boarding schools at the Mescalero and the Puebla and the Jicarilla agencies, and 15 day schools at the latter agency. In 1899 there were 50 periodicals, of which 4 were dailies and 42 weeklies.

Finances.—The total assessed value of real and personal property for 1898 was \$40,124,724; the total Territorial debt, June 30, 1899, was \$1,243,400; aggregate of county debts same date, \$2,997,665.

Population.—On September 20, 1899, Governor Otero estimated the population by counties as 260,500; Indian population, 25,329—total, 285,829.

Legislation.—It was enacted that banks shall publish annually names and amount of deposits whenever accounts have not been drawn upon for three years. Cattle must be inspected before shipment and a record kept of cattle slaughtered, with description and names and addresses of vendors. Laws were passed to prevent pollution of springs, wells, and streams. County commissioners were authorized to make quarantine regulations as to diseased fruit. The District Court appoints three persons, who select the juries, and the party demanding a jury must pay \$24 a day in advance as jurors' fees, to be taxed as costs. A Territorial commerce commission was created, with extraordinary powers, among them that of fixing the minimum and maximum price at which coal-oil shall be sold, heavy penalties, with revocation of license, being imposed for selling under or over the prices fixed. Corporations producing, refining, and selling coal-oil or any product of petroleum must be licensed and pay \$500 annually to the Territory; those who do not produce, but sell only must pay a small license as wholesale or retail dealers.

Territorial Officers and National Representatives.—Governor, Miguel A. Otero; secretary, George H. Wallace; treasurer, J. H. Vaughn; auditor, L. M. Ortiz; adjutant-general, W. H. Whiteman; attorney-general, E. L. Bartlett; superintendent of education, M. C. de Baca. Supreme Court: Chief justice, William J. Mills; associate justices, John R. McFie, J. W. Crumpacker, F. W. Parker, C. C. Leland;

clerk, José D. Sena. The Territorial legislature consists of 30 Republicans and 6 Democrats. Representative, Pedro Perea (Rep.), from Santa Fé.

NEW SOUTH WALES is a British colony in southeastern Australia; it has an area of 310,700 square miles, and had a population on June 30, 1899, of 1,357,050; the city of Sydney, with a population, including the suburbs, of 426,950, is the capital and the chief city of the colony; it contains the government buildings, the royal mint, a university, a national art gallery, a public library, an observatory, and two cathedrals; Sydney is not only the chief distributing point for the trade of Australia, but according to United States Consular Reports for May, 1899, it is in the value of its tonnage probably the tenth commercial port of the world. In 1897 the tonnage was 4,257,299 and the total for all ports, 6,744,431. The principal occupations of New South Wales are pastoral and agricultural farming, and mining. The chief crops are wheat, maize, barley, oats, potatoes, hay, sugar, and tobacco, and the chief fruit cultures are those of the orange and the vine; from the latter 845,232 gallons of wine were produced in the year ending with March, 1899. Other figures for the given fiscal year are: Wheat and other grains, 15,728,496 bushels; oranges, 7,839,216 dozen; sugar-cane, 289,206 tons, and tobacco, 12,706 cwt. From the grazing interests of New South Wales the staple product wool is produced. At the beginning of 1899 there were 41,241,004 sheep in the colony, and the amount of wool produced amounted to 271,864,306 pounds, valued at £8,361,721. As an agricultural country the importance of New South Wales is steadily growing, but a succession of droughts during the last few years has severely told upon the colony and caused a decrease in crops of nearly all kinds. In live stock also the country has hardly held its own, the effect of the drought upon grazing having especially affected the production of wool; within eight years the number of sheep has decreased by over 20,000,000, placing the colony's proportion of the world's sheep at about one-thirteenth, as against one-eighth a few years ago. These figures were given by the government statistician at Sydney in a report dated early in 1899. He adds that although these statistics speak discouragingly for the immediate future of the colony, it must not be thought that the country is struggling under an overmastering depression. Owing to the energy and wealth of the people, the business of the country, he reports, can justly be said to be, on the whole, fairly prosperous, and there is no indication of industrial paralysis. Indications in 1899 were that the long-continued drought had broken, at least in a large portion of the colony, and a more hopeful feeling was gradually extending throughout business and industrial circles. The chief mineral products are gold and coal, others being silver, copper, iron, tin, antimony, bismuth, chrome, platinum, and precious stones, the total value of minerals taken out in 1898 being £4,794,928. One-fourth of this amount represents gold. As to the trade, the imports in 1898 were £24,453,560, and the exports £27,648,117. Not considering Great Britain and her colonies, which absorb a major part of the trade, the United States, France, and Germany took about equal amounts of exports, while in imports into New South Wales the United States led, with Germany second. At the beginning of 1899 the railway mileage of the colony was about 2700. The government is somewhat similar to those of the other Australian colonies. The executive authority is vested in a governor, who is aided by a cabinet of ten ministers. The Rt. Hon. Earl Beauchamp was appointed governor in 1899. The premier was W. J. Lyne, who succeeded to the office September 14, 1899, upon the resignation of Minister Reid and his cabinet. The legislative authority is vested in a bicameral parliament, the upper house being known as the legislative council and the lower as the legislative assembly. The members of the former are appointed by the crown for life, and those of the latter are elected by popular vote. Education is controlled by the state, and is compulsory for children between 6 and 14 years of age. There is freedom of religious worship, all sects being on an equal footing.

History, 1899.—In 1899, as during the previous year, the principal political question was the matter of federation, a full account of which is given in the article **AUSTRALIAN FEDERATION** (*q. v.*). New South Wales, as the oldest of the Australian colonies, was especially deferred to in the matter, and Queensland withheld its vote until the decision of New South Wales had been made. In 1898 the proposition was defeated in the latter state, the reasons given being that the constitution as drafted at Melbourne made it possible for the other colonies to outvote New South Wales, especially in tariff matters, and that there were other provisions relating to financial, legal, and territorial rights, etc., which were objectionable. A change in the government occurred late in the year, and in March the amended Federal Enabling bill was again submitted to the colonial legislature, and passed, and later in June approved by the people by a vote of 101,200 to 79,634. The imperial government was officially asked by the legislature also to endorse the bill. The reverses which affected all the colonies which had supported federation, due largely to the withdrawal from the government's support of those who had stood by it only until the bill had been passed, took place in South Australia under peculiar circumstances. The opposition

party, re-enforced by the labor party, passed in September a vote of want of confidence in the government, mainly on financial questions. Mr. Reid accordingly resigned, and Mr. Lyne became premier in the new administration. A force for service in the South African war was offered to the imperial government, and accepted. The budget estimate for the year showed a revenue of £9,720,000 and an expenditure of £9,909,000. The public debt in 1898-99 was £67,000,000.

NEW YORK, a Middle Atlantic State of the United States, has an area of 49,170 square miles. Capital, Albany.

Mineralogy.—In 1898 the State maintained its rank as the first salt-producing State in the country, gained in 1893, with a total output of 6,791,798 barrels, valued at \$2,369,323. The principal grades and quantities thereof were, coarse solar, 2,493,285 barrels; rock, 1,556,300; table and dairy, 1,254,854; and common fine, 1,240,325. Quarrying yielded granite, used principally for building and road-making purposes, \$516,847; sandstone, \$566,133; slate, nearly all roofing, \$48,694; marble, \$342,072; and limestone, about equally divided between building, road-making, and lime-burning purposes, \$1,533,936—total value, \$3,007,682, giving the State fourth rank. The iron production was 179,951 long tons, mostly magnetite, valued at \$350,999. (See paragraph Manufactures.) Gypsum yielded 33,440 short tons, valued at \$78,684, the largest part being calcined into plaster of paris, and the next largest ground into land plaster; and fibrous talc, 54,356 short tons, valued at \$411,430.

Manufactures.—During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$46,634,980, the second largest amount among the States. There were 503 manufacturers of tobacco and 7067 of cigars, and the combined output in the calendar year 1898 was 1,203,976,944 cigars, 1,963,720,602 cigarettes, 2,641,513 pounds of plug tobacco, 1,949,130 pounds of fine-cut, 11,245,064 pounds of smoking, and 91,457 pounds of snuff. Grain and fruit distilleries in operation numbered 37; the production of fruit brandy was 32,605 gallons; quantity of spirits rectified, 12,192,291 gallons; distilled spirits gauged, 28,762,319 gallons, and fermented liquors produced, 9,665,347 barrels. During the calendar year 1898 the production of pig-iron was 228,011 long tons, and of all kinds of rolled iron and steel, 83,735 long tons. New York and New Jersey together had an output of 47,957 long tons of open-hearth steel, 3110 long tons of steel plates and sheets, and 109,833 kegs of wire nails, and New York and Connecticut together produced 8365 long tons of crucible steel. The report of the Bureau of Labor Statistics showed that the percentage of idleness among members of labor organizations was reduced in 1899 from 10.7 on June 30 to 2.3 on September 30. On the last date there were 1320 trade unions with a membership of 209,120, of whom only 4788 were unemployed. See SILK MANUFACTURES.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at New York City (\$465,558,936) and eleven other ports aggregated in value \$484,144,866; exports at New York City (\$459,444,217) and other ports, \$487,999,957, an increase in a year of \$67,006,572 in imports and \$14,794,021 in exports. The movement of gold and silver was, imports, \$57,057,847; exports, \$87,023,327, making the total foreign trade of the year \$1,116,225,997, a net increase of \$68,523,193.

Transportation.—The new railway construction during the calendar year 1898 was 45.38 miles, and during 1899 40.65 miles, giving the State a total mileage of 8,193.29. In the fiscal year 1898-99 the steam surface roads had gross earnings of \$5,977,508 in excess of those of the previous year; the operating expenses were \$2,855,613 in excess, making the net earnings from operation \$3,121,895 in excess; and the income from other sources was \$2,034,990 in excess. The excess of taxes was \$506,051; declared dividends, \$534,692; capital stock, \$8,977,400; and funded debt, \$11,985,383. During the year 704 persons were killed and 1326 injured on the steam surface roads, an increase of 4 in killed and a decrease of 181 in injured. The street surface roads in the boroughs of the Bronx and Manhattan carried 509,314,816 passengers; the elevated roads, 213,248,419; and both systems in the boroughs of Queens and Brooklyn, 238,721,051. Steam roads, excluding elevated, carried 149,926,184 passengers.

Banks.—On October 31, 1899, there were 327 national banks in operation and 156 in liquidation. The active capital aggregated \$82,012,390; circulation, \$39,418,530; deposits, \$848,831,252; reserve, \$217,351,899; and resources, \$1,210,633,128. State banks, September 30, 1899, numbered 208, and had capital \$29,545,700; deposits, \$270,033,433; resources, \$372,982,538; and surplus and undivided profits, \$27,654,219; loan and trust companies, 52, with capital, \$38,050,000; deposits, \$594,462,705, and resources, \$722,356,523; and private banks, 15, with capital \$270,000; deposits, \$1,654,714; and resources, \$2,117,720. There were 130 mutual savings banks, with depositors, 1,865,653; deposits, \$816,144,368; resources, \$923,420,862; and surplus, \$106,896,623. During the year ending September 30, 1899, the exchanges at the United States clearing houses at New York, Buffalo, Rochester, Syracuse, and Binghamton aggregated \$57,785,850,085, an increase in a year of \$17,550,234,099.

Insurance.—Official reports for the calendar year 1898 show that, excluding indus-

trial policies, the State life insurance companies wrote 276,295 policies, insuring \$595,470,427, and terminated 166,952 policies, insuring \$412,666,510. Life companies of other States issued 209,440 policies, insuring \$422,895,600, and terminated 120,944 policies, insuring \$255,416,105. Life policies increased in the year 54,278, and the amount of insurance written, \$94,561,151. Industrial companies issued 8,242,198 policies in the year, insuring \$1,058,467,079, against 7,612,134 policies and \$958,449,297 insurance in 1897. Casualty and fidelity companies had capital, \$11,829,600; receipts, \$18,729,413; disbursements, \$16,577,508; risks in force, \$3,386,126,676; and assets, \$34,928,788. Assessment life companies reported receipts, \$18,857,426, a decrease of \$3,738,335; disbursements, \$17,935,250; and certificates in force, 529,628, a decrease of 77,537; and the various fraternal organizations had receipts, \$30,638,570, increase, \$497,331; disbursements, \$28,576,692; and certificates of membership, 1,374,371, increase, 43,141.

Education.—The State superintendent of public instruction reported that at the close of the school year 1898-99 the school population was 1,550,079; enrolment in the public schools, 1,179,351, and in private schools, 161,708. There were 33,992 public school teachers, who received an aggregate in salaries of \$16,484,646. The total expenditure for educational purposes was \$28,052,990, a decrease from the total of the previous year of \$422,881. This decrease was occasioned by a falling off in the money expended for schools, new building sites, furniture, and repairs. In 1898, \$8,611,548 was expended for such purposes, while in 1899 only \$6,417,915 was so used. This decrease of \$2,195,632, combined with a decrease of \$23,269 in expenditures for libraries, more than offsets the increase of \$1,328,368 in teachers' salaries, and produces the net decrease of \$422,881. The value of all the public school property in the State was reported as \$75,153,615, and the number of volumes in the public school libraries, 1,544,170. The State Board of Regents reported that during the past year there had been a decided advance in the standards of business education in the State, and that, largely on account of the movement here, there had been also a distinct increase in the interest taken in business education in other States. The high schools numbered 541, and academies 134, and together they had 69,776 students. High school expenditures aggregated \$3,708,195, and the total expenditure for secondary instruction was \$5,226,824, of which \$3,212,155 was from local sources. At the close of the school year 1897-98 there were 15 public normal schools, with 360 teachers and 5666 students in all departments and 2 private ones, with 83 teachers and 526 students. Normal training was also given in 9 colleges and 71 public high schools. Twenty-three universities and colleges for men and for both sexes reported 55 fellowships, 1522 scholarships, 1288 professors and instructors, 12,007 students, 949,342 volumes in the libraries, valued at \$1,802,397, \$1,413,727 invested in scientific apparatus, \$20,891,155 in grounds and buildings, and \$24,199,969 in productive funds, \$2,744,844 in total income, and \$1,190,861 in benefactions. Five colleges for women reported one fellowship, 35 scholarships, 183 professors and instructors, 1798 students, 49,907 volumes in the libraries, \$107,458 in scientific apparatus, \$2,191,512 in grounds and buildings, and \$1,272,204 in productive funds, \$489,222 in total income, and \$211,499 in benefactions. In all universities, colleges, professional, technical, and other special schools, there was a total of 31,499 students in 1899. The periodicals in that year numbered 2066, of which 180 were dailies, 1120 weeklies, 598 monthlies, and 47 quarterlies.

State Charities.—According to the annual report of the State Board of Charities, the number of State beneficiaries of charitable institutions, on October 1, 1899, was 71,261, while those receiving outdoor relief and living mainly at their homes aggregated more than 2,000,000. The property of the various State institutions was valued at \$111,000,000; the receipts were about \$25,000,000, and the expenditures exceeded \$22,000,000.

Finances.—In the State fiscal year ending September 30, 1899, the receipts of the State Treasury aggregated \$29,810,941, a decrease in a year of \$4,651,270; disbursements, \$25,306,126, decrease, \$8,451,855; balance on hand, October 1, \$4,504,814, increase, \$531,010. Among the receipts were \$2,266,650 from the annual tax on corporations; \$2,194,612 from the inheritance tax; and \$4,231,229, the State's portion of the revenue under the excise law, the total of which was \$12,582,248. The State Board of Tax Commissioners reported in 1899 that the taxable property of the State, based on assessors' reports for 1898, showed an increase over that of the previous year of \$177,785,805. The assessed valuations as equalized for taxation were: Real estate, \$4,413,848,496; personal property, \$662,548,328—total, \$5,076,396,824. The tax rate was \$2.49 per \$1000, and the amount of State tax levied, \$12,640,228. The bonded debt, September 30, 1899, was \$10,185,660, mostly represented by canal improvement bonds.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 7,175,000.

Elections.—The elections in New York resulted in the return of a Republican legislature. A member of Congress was elected also, the Republican candidate being

chosen. In New York City elections, however, Tammany won by 50,000 majority. Mr. Mazet, who stood for re-election to the Assembly on the Republican ticket, was defeated by the combined votes of Tammany and the Citizens' Union. Ex-Justice Daly, whose nomination was an endorsement of the principle of the independence of the bench, was also defeated, though supported by the Republicans, the Citizens' Union, and the Independent Labor party. Elsewhere throughout the State the Republicans made gains. In various cities local fusion tickets were formed for the pursuance of good government campaigns. Four constitutional amendments were submitted to the people in the State elections, all of which were carried. The most important related to the debt limit of New York City.

The Legislature.—When the session opened on January 4 the Republicans, with a majority of 3 in the Senate and of 24 in the Assembly, elected Senator Ellsworth president *pro tem.* of the Senate, and Samuel F. Nixon, speaker of the Assembly. The bill for a change from annual to biennial sessions was lost by 1 vote. The labor unions were against it, because, they said, it would tend to reduce the popular control over legislation. The legislature adjourned on April 28, but was called together in special session by the governor on May 22, in order to act upon certain amendments to the Ford bill on taxation of franchises, which had passed on May 11. On May 25 the bill, as amended in accordance with the governor's suggestions, was passed. Besides the Ford bill, important matters considered by the legislature were those regarding the Erie Canal investigation, the Mazet investigation, the State constabulary, civil service, anti-trust legislation, the Ramapo water scheme, the Raines Election law and the liquor amendment, and educational unification. Some of these subjects will be referred to in succeeding paragraphs.

The Ford Bill.—Early in the year Senator John Ford, of New York City, introduced a bill taxing the franchises of street railroads, gas companies, telephone companies, and the like, and attempted to show the analogy between the value of such franchises and the value of municipal real estate. Governor Roosevelt strongly supported the measure, and urged that it be passed in some form during the session. He explained that he had no sympathy with the outcry against corporations, but it was also his belief that they should be asked to bear their just proportion of taxation. The bill was passed in the Assembly on the last day of the session, and in a special meeting of the legislature called for that purpose the necessary amendments suggested by the governor were added to it. It is regarded as one of the most important measures of the year, and will create an additional tax income estimated at about \$17,000,000, of which New York City will contribute about 60 per cent.

Canals.—In view of the fact that the State appropriation of \$9,000,000 for the improvement of the Erie Canal had been expended with apparent recklessness, if not in a corrupt manner, there was a popular demand in 1899 for a public investigation of the former canal management. Governor Roosevelt engaged two well-known Democratic lawyers to represent the State in the investigation of the Republican management, and appointed a committee to examine the whole canal question, especially in relation to its commercial aspects. Their report was not ready at the end of the year. It was intended that the investigation of the charges against the former canal management should leave no room for any further question as to criminal proceedings. After several months' work a report was rendered to the effect that criminal prosecutions were unadvisable and impracticable, but that sufficient delinquency on the part of those charged with the work had been shown to justify public indignation. Consequently, a complete change in methods and management was made. Under the new superintendent of public works, Colonel John N. Partridge, of Brooklyn, at the end of a season of unusual activity on the canals, October 1, 1899, it was shown that although more business had been done than was done in the previous season, a net saving of nearly \$140,000, or about 25 per cent., had been effected, and that the canals had been managed with an eye single to the public good. The statement was made by Attorney-General Davies that claims aggregating nearly \$1,000,000 had been made by property owners for damage due to work under the \$9,000,000 appropriation for canal improvements.

Civil Service.—A bill to secure recognition of merit in appointments to the civil service was passed on April 18, under which the great bulk of the classified officers are taken out of the domain of politics. Since the new rules were promulgated examinations for all positions subject to them have been held in thirty cities, so as to accommodate applicants in every part of the State, and the increased attendance at these examinations indicates an appreciation of the relief from the double examinations required by the previous law. The present law is one of those especially fostered by Governor Roosevelt, who favored the re-enactment of a number of provisions which had been considered unpractical by the previous State administration.

Other Legislation.—The Primary Election law was amended so as to improve the methods of enrolment, as well as to make nominations more generally repre-

sentative. The Raines Election bill was passed, despite the bitter opposition of the minority, who called it the "Force bill." This law makes special provisions for legal proceedings, "including an extraordinary term of the Supreme Court, on notification from the attorney-general of a violation of the laws regarding honest elections in any county in the metropolitan elections district." An anti-trust law was passed, the validity of which is denied by some lawyers, but which was not opposed by the trusts. This law declares guilty of misdemeanor any officer of a corporation who enters into any trust agreement, and authorizes the attorney-general to bring action to restrain such action. Trusts and pools to control rates of transportation between this country and Europe were forbidden. The State Constabulary bill, which was defeated, aimed to create a State police under a single commissioner, with responsible heads placed over the State forces in the larger cities, the idea being to remove the police from political control. Efforts to bring about an educational unification scheme failed, but it is thought that it will be brought up again before long.

Labor.—A large number of strikes occurred during the year, many of which were closed, however, through arbitration. Amendments to the labor laws passed by the legislature of 1899 require inspection and license for all rooms used for manufacturing purposes in tenement-houses, adequate light and cubic feet of air space, and destruction of all infected articles and of all articles manufactured under unclean or unsanitary conditions. (See CONSUMERS' LEAGUE.) For the protection of workingmen new safeguards were provided by the transfer from the police to the factory inspector of the duty of inspecting scaffolding, ropes, etc., and by requiring mechanical contrivances for safety in operating machines. For women and minors the hours of employment in any factory must not exceed the rate of 60 hours in 1 week or 10 hours a day for 6 days. For all work-people employed by the State the new law of May 12 limits work to an average of 8 hours a day.

Reform Conference.—A conference of about 200 delegates was held at Buffalo, June 28 to July 3, to discuss plans for changing certain social, political, and economic conditions. Certain inequalities of the present industrial system were condemned, and the present form of government was claimed to be non-representative, the will of the people being thwarted, it was affirmed, by the legislative bodies. The delegates pledged themselves to support the party putting into its platform the reforms most desired. Resolutions were adopted in favor of uniting educationally for direct legislation, and in favor of public ownership of public utilities, and a single tax and an income tax were approved of. The right of women to vote on terms of equality with men was unanimously approved. A committee was appointed, with the Rev. W. P. Bliss as chairman, to organize a Social Reform Union in support of the various reforms advocated. One outgrowth of the conference was the establishment of a School of Economic Research and Instruction, in which there shall be no restrictions upon the freedom of investigation, teaching, or expression of convictions.

The Independent Labor Party was formed August 17, 1899, at a conference of representatives of the working-men of Greater New York. The movement was an outgrowth of the Brooklyn and Manhattan street-car strikes, and the failure of the Tammany officials to enforce the ten-hour law as applying to the employees of the surface railroads. The platform demands, among other things, municipal ownership and operation of street railways, telephones, electric plants, gas-works, and all similar public utilities; eight hours' work for all employees engaged directly or indirectly on State and municipal work, and the strict enforcement by the authorities of all labor laws; the abolition of the contract system on public works, and the employment of labor at union wages in the manufacture of all articles supplied to the State and municipality; liability of employers for injury to health and body, or loss of life sustained by workmen in course of employment; home rule in taxation; municipalities to have full power to determine upon their system of taxation; the immediate construction by the city of the underground rapid-transit system in obedience to the will of the people, as decided by the overwhelming majority of the voters; and sufficient school accommodations for all children.

The Mazet Committee.—The State Assembly appointed a committee of five Republicans and two Democrats on March 31 to investigate the alleged corruption in the Tammany administration in New York City. The members of this committee were Robert Mazet, chairman, and Edward H. Fallows, Thomas M. Costello, James B. McEwan, Harris Wilson, Benjamin Hoffman, and Anthony J. Boland. The chief counsel was Frank Moss, former president of the New York City police board. Many departments of the city government were examined, and prominent officials were subpoenaed as witnesses. Dr. Parkhurst, who was closely identified with the Lexow investigation, which resulted in bringing about the reform administration of Mayor Strong, denounced the present movement as being of a partisan character. Although few new facts were disclosed, the investigation revealed anew the inefficiency of the Tammany government. It was the opinion of some, however,

including the committee's chief counsel, that the inquiry should have been extended to include also certain leaders of the opposite party. One revelation of importance was that Tammany candidates for the judges' bench were systematically levied upon under the form of campaign assessments. The New York Bar Association, one of the foremost legal bodies in the country, made this an issue in the November elections, but Judge Daly, who stood for the integrity of the bench, was defeated by an overwhelming Tammany vote. Another matter of interest during the session was the examination of Richard Croker, who frankly acknowledged his control of New York City affairs and his participation in the political spoils. His admission that he was "working for his own pocket all the time" created considerable diversion in the press. The committee's report was to be made to the legislature in 1900.

The Ramapo Water Scheme.—The New York City Board of Public Improvements received a report on August 16 from the commissioner of water-supply approving a contract for a term of 40 years, whereby the Ramapo Water Company was to supply the city with 200,000,000 gallons of water daily at a rate of \$70 per million gallons, the company to retain the ownership of the plant. The force of public indignation aroused by a contract of such a nature compelled the authorities to delay action pending investigation. Comptroller Coler, a Democrat, was especially active in opposing the scheme. By the aid of the Supreme Court he enjoined the board from confirming the contract, and the matter was carried into the State legislature. The Ramapo company claimed to have obtained the water rights in nearly a score of counties, its name being derived from the lake region in and about the Ramapo Mountains, near the New Jersey border line. Its opponents doubted its power to furnish a sufficient supply of water, and in any case, they said, it was absurd to contract for such a supply with a private company at such an enormous figure, and before a stroke of work had been done to assure the city that the proposal could be properly and effectively carried out. The company, they said, was asking the city to assure them of a capital of many million dollars, while the city might for a much smaller sum condemn the necessary lands, and in the end possess its own plant.

Other City Affairs.—On January 6, 1899, James A. Coogan was elected president of the municipal assembly for three years with an annual salary of \$5000. The refusal of the municipal council to approve issues of bonds indispensable for the carrying out of duly authorized public works led to proceedings against it. The council having refused to issue bonds to provide for the new hall of records, and having ignored the order of the Supreme Court to pass the issues, a number of members of the council were ordered by the court to be placed under arrest. The council met August 9 and passed the entire issue. There was much discussion in 1899 of defects in the charter, and some demanded an amendment abolishing the assembly and constituting the council alone as the municipal legislature. The borough system was also criticised, and many favored the abolition of the office of borough president. Another important matter during the year related to the payment of public-school teachers, whose salaries had been delayed for months. The Ahearn bill, making all public-school teachers in New York City eligible to an increase of salary under certain conditions, and providing that the lowest annual salary should be \$600, became a State law in April, and was welcomed as a compromise of a long undecided question.

State Officers and National Representatives.—Governor, Theodore Roosevelt; lieutenant-governor, Timothy L. Woodruff; secretary of state, John T. McDonough; comptroller, William J. Morgan; treasurer, John P. Jaeckel; attorney-general, John C. Davies; engineer and surveyor, Edward A. Bond; superintendent of public instruction, Charles R. Skinner; superintendent of insurance, Louis F. Payn; superintendent of banking department, Frederick D. Kilburn; superintendent of State prisons, Cornelius V. Collins; superintendent of public works, John N. Partridge. Court of Appeals: Chief judge, Alton B. Parker; associate judges, Albert Haight, John Clinton Gray, Irving G. Vann, Edward T. Bartlett, Dennis O'Brien, Celora E. Martin; clerk, William H. Shankland. The State legislature consists of 119 Republicans, 79 Democrats, and 1 Independent Democrat, and there is 1 vacancy. New York is represented in Congress as follows: Senators, Thomas C. Platt, of New York, and Chauncey M. Depew, of New York, both Republicans. Representatives, Townsend Scudder (Dem.), from Glen Head; J. J. Fitzgerald (Dem.), from Brooklyn; Edmund H. Driggs (Dem.), from Brooklyn; Bertram T. Clayton (Dem.), from Brooklyn; Dr. Frank E. Wilson (Dem.), from Brooklyn; Mitchell May (Dem.), from Brooklyn; Nicholas Muller (Dem.), from New York; Daniel J. Riordan (Dem.), from New York; Thomas J. Bradley (Dem.), from New York; Amos J. Cummings (Dem.), from New York; William Sulzer (Dem.), from New York; George B. McClellan (Dem.), from New York; Jefferson M. Levy (Dem.), from New York; William A. Chanler (Dem.), from New York; Jacob Ruppert, Jr. (Dem.), from New York; J. Q. Underhill (Dem.), from New Rochelle; A. S.

Tompkins (Rep.), from Nyack; J. H. Ketcham (Rep.), from Dover Plains; A. V. S. Cochrane (Rep.), from Hudson; Martin H. Glynn (Dem.), from Albany; John K. Stewart (Rep.), from Amsterdam; L. N. Littauer (Rep.), from Gloversville; L. W. Emerson (Rep.), from Warrensburg; C. A. Chickering (Rep.), from Copenhagen; James S. Sherman (Rep.), from Utica; George W. Ray (Rep.), from Norwich; M. E. Driscoll (Rep.), from Syracuse; Sereno E. Payne (Rep.), from Auburn; Charles W. Gillet (Rep.), from Addison; James W. Wadsworth (Rep.), from Geneseo; J. M. E. O'Grady (Rep.), from Rochester; William H. Ryan (Dem.), from Buffalo; D. S. Alexander (Rep.), from Buffalo; Edward B. Vreeland (Rep.), from Salamanca (*vice* Warren B. Hooker, who resigned March 30, 1899).

NEW YORK ACADEMY OF SCIENCES, incorporated 1818 as the Lyceum of Natural History in the City of New York, holds an annual reception and exhibition in the spring, and publishes *Annals* (current volume XII.). In 1899 it had 333 resident members and fellows, and 42 honorary members, besides corresponding members. President, Robert S. Woodward; secretary, Richard E. Dodge, Teachers' College, New York City. See ZOOLOGICAL SOCIETIES.

NEW YORK CHAMBER OF COMMERCE, organized in 1768 "to promote and extend just and lawful commerce," had in 1899 a membership of 1250. Secretary, George Wilson, 32 Nassau Street, New York City.

NEW YORK PUBLIC LIBRARY, ASTOR, LENOX, AND TILDEN FOUNDATIONS, consolidated in 1895, has at present two buildings, the Astor, 40 Lafayette Place, and the Lenox, which contains also an art collection, at 895 Fifth Avenue, both buildings being open free from 9 A.M. to 6 P.M. The number of visitors in the last fiscal year to the Astor was 84,977, and to the Lenox, 26,061. There were 33,569 visitors to the art gallery. Among the accessions during the year were: 800 volumes, purchased with the Schiff fund at the Joachimsthal sale in Amsterdam; the gift of the Gordon L. Ford library, by his sons, Worthington C. Ford and Paul L. Ford, a collection rich in American history between the years 1750-1850, containing early journals of Congress, American biography, and economics, and early American poetry; a number of books, pamphlets, and newspapers on music, and on the socialistic movement, given by F. A. Sorge; 200 volumes of rare Americana, dealing with the earliest period of American discovery, given by Mr. Maitland; and in December, 451 volumes, 325 pamphlets, and 52 volumes of newspapers, relating to Mormonism, presented by Miss Helen M. Gould. A department of Slavic literature was established during the year by the accession of 1300 volumes, and a course of instruction was given to apprentices. On March 19 the Board of Estimate and Apportionment authorized the issue of bonds for \$500,000 for removing the reservoir at Forty-second Street and Fifth Avenue, and for laying there the foundations of the new library building. The number of available volumes was 459,248, besides 117,000 pamphlets; the accessions during the year, exclusive of the Ford gift, which contains some 100,000 volumes and pamphlets, number 34,182, and 7436 feet of shelving were added to the two buildings. The law books were all transferred to the Lenox building. Director, John S. Billings.

NEW YORK UNIVERSITY, in New York City, was chartered in 1831. The year 1898-99 was noteworthy in the large attendance at the university, while its resources were increased by gifts in money of about a third of a million dollars. Among the many notable events of the year are the following: The newly consolidated University and Bellevue Hospital Medical College was opened in October, 1898, occupying the East College Building, the new College Building, and the Carnegie Laboratory, property representing about half a million dollars; the enrolment exceeding 400 students, and the faculty 95 members. The Graduate School was opened with an unusual representation of colleges throughout the United States—namely, 14 colleges in New York State, 7 in New England, 13 in the Middle States and Ohio, 14 in the Western and Southern States, besides foreign universities and gymnasia to the number of 17. The University Extension Work was strengthened by an endowment of \$12,000 for the Woman's Law Class, intended particularly for business women. The Hall of Pedagogy, comprising 21 rooms on the ninth floor of the Washington Square Building, was completed during the summer, representing \$100,000 investment by the University, besides \$8000 for new improvements. The name of the Undergraduate College was changed to the University College of Arts and Pure Science. A large gift from a German-American citizen of New York was received for a Library of German Language and Literature. The New York University School of Applied Science was announced in the spring, upon the occasion of a gift for an engineering endowment of \$200,000. The school was divided into four departments, civil, mechanical and chemical engineering, and industrial chemistry. For statistics see UNIVERSITIES AND COLLEGES.

NEW YORK ZOOLOGICAL SOCIETY. See ZOOLOGICAL SOCIETIES.

NEW ZEALAND is a group of islands belonging to Great Britain, and lies about 1200 miles east of Australia, with a total area of 104,471 square miles, and an estimated population in 1899 of 787,784, of whom 39,854 are natives or Maoris. Excluding the latter, 98 per cent. of the population is British, 63 per cent. being born in New Zealand and 31 per cent. in the United Kingdom. There are two principal islands, North Island, with an area of 44,468 square miles, and South or Middle Island, with an area of 58,525 square miles, containing most of the population. There is also Stewart Island, area 665 square miles, and small outlying islands, some of which are uninhabited. The principal cities are Wellington, the capital, population 47,207 in 1899, and Auckland, population 63,209, in North Island; and Dunedin, 49,492, and Christchurch, 56,330, in South Island. These estimates include the suburbs of the cities mentioned. In North Island are active volcanoes, and the famous geyser and hot lake regions. In South Island the western coast range rises to a height in Mt. Cook of over 12,000 feet. Besides dense forests, the colony contains considerable arable land, which is easily worked. The climate is unusually fine, and production is possible throughout the year. The chief occupations are agricultural and pastoral pursuits, and the exportation of frozen meat, a rapidly growing industry, is increasing. The principal crops are wheat, oats, barley, and hay, and hemp is an important product, while there are many million sheep in the colony. Mining is very important, among the metals being gold, the most important, and coal, silver, antimony, and manganese. Another valuable product is kauri-gum, from a valuable timber-pine of the New Zealand forests. In 1898 the commerce of New Zealand amounted to £10,517,955 for exports and £8,230,600 for imports. The principal exports were in the order of importance wool, frozen meat, gold, kauri-gum, dairy products, animal products, grain, and flour. The imports were chiefly cloth and clothing, and iron goods and machinery. Others were sugar, books and stationery, spirits, fruit, tea, tobacco, and oils. Among the British Australasian colonies New Zealand stands third in the magnitude of its trade. This trade is divided about equally between the four ports, Auckland and Wellington in North Island, and in South Island Dunedin and Lyttelton, the latter being the port of Christchurch. During 1898 about 620 vessels visited these ports, with a tonnage of about 765,500. There are regular lines to Australia and England. In March, 1899, there were 2257 miles of railroads, mostly state lines, including 81 miles under construction. The telegraph mileage was about 6800. Education is free and compulsory. At the beginning of 1899 there were 1624 public primary schools with an attendance of 131,621, and 294 private schools. There are also 25 endowed grammar schools and colleges, and the University of New Zealand, an examining body which grants degrees. The government consists of a governor and a responsible ministry and of a legislature. The latter is made up of a legislative council of 48 members, appointed by the governor for seven years, and of a house of representatives of seventy-four members elected for three years. Four of the representatives are Maoris, elected by the natives. Women have the right of suffrage, but may not hold office. The governor in 1899 was the Earl of Ranfurly, and the premier was the Rt. Hon. Richard J. Seddon. New Zealand was not included in the Australian federation scheme upon which the five Australian colonies and Tasmania voted in 1899, although she was represented at some of the earlier conferences on the subject. The great distance of the colony from the other British colonies of Australasia was one of the principal drawbacks to political union with those states. In common with the Australian colonies and Tasmania, however, New Zealand in 1899 offered a military force to the imperial government for service in South Africa, and a body of mounted rifles was sent to the Transvaal in October upon the acceptance of the offer. The treasury budget for the year 1899 estimated the public revenue at £5,300,000, and the expenditure at £5,060,000. It was stated that a loan of £1,000,000 would be necessary for the construction of roads and railways. In 1899 the public debt was £46,080,727. See LABOR.

NICARAGUA, a republic of Central America, lying between Honduras and Costa Rica on the north and south, and the Caribbean Sea and Pacific Ocean on the east and west respectively. The capital is Managua.

Area and Population.—The country comprises 13 provinces, the aggregate area of which is 49,200 square miles, and the population (1895) 420,000, including about 40,000 uncivilized Indians. Almost the entire remaining population consists of civilized Indians, negroes, mulattoes, and mestizos; the inhabitants of pure European blood, though increasing, number not many more than 1200. Approximate populations of the chief towns are: Leon, 34,000; Managua, 18,000; Granada and Masaya, each 15,000; Rivas, 8000; Bluefields, 2100; San Juan del Norte, 1500.

Government and Education.—By the constitution, dating from July 4, 1894, the chief executive authority is vested in a president, who is elected for a term of four years, and is assisted by a cabinet of responsible ministers, who direct the following departments: the interior, justice, war, and marine; foreign affairs and public in-

struction; finance, and public works. The president is Señor José Santos Zelaya, who was re-elected for the term ending in 1902. The legislative power devolves upon a congress composed of forty representatives, elected by popular vote for terms of two years. The regular army is reported to comprise an active force of 2000 men and a reserve force of 10,000; in addition there is a national militia of 5000. It was reported in October, 1899, that the government had purchased a new war-ship called the *Osorno*.

Education is in a very backward condition. In 1894 there were somewhat more than 1000 schools with an enrolment of about 20,000 pupils; but the instruction was not attended with great success. Roman Catholicism is the prevailing religion.

Finance.—The chief items of revenue are custom duties, national railway and steamboat returns, and imports on alcoholic liquors; the largest expenditures are for finance, war, and public works. In 1896 the revenue and expenditure in pesos were 3,572,497 and 4,688,061 respectively; in 1897 the revenue was 4,059,674 pesos and the expenditure 3,852,750 pesos. The expenditure authorized for 1898 was 5,097,588 pesos. In July, 1898, the foreign public debt, with arrears, amounted to \$1,404,899. In 1894 the internal debt was \$3,052,000; an additional debt of \$218,000 was contracted in November, 1896. On October 1, 1899, the value of the peso in United States gold was \$0.436. The financial state of the country in 1899 was not bright; great hopes of prosperity, however, were placed on the American plan for the Nicaragua Canal.

Industries and Commerce.—Cattle breeding and agriculture may be called the leading industries; only a small portion of the tillable soil, however, is under cultivation. The leading crop is coffee, with sugar and bananas ranking next. Under the concession made by the government to Mr. George D. Emery, of Chelsea, Mass., for the exploitation of mahogany, rosewood, etc., there were shipped from Rio Grande in 1898, 14,000 logs. The rubber industry is increasing, attention being given now to the culture of the trees; formerly the product was obtained solely from the wild growths. Gold and silver are found, and recently there has been mining activity in the department of Zelaya (Mosquito Reservation). About one-third of the coffee estates at the present time are owned, mortgaged, or worked by Germans, and "in other lines of business it is to be noted that there are from two to three German houses to one of other foreign nationality." About two-thirds of the foreign trade passes through the Pacific port, Corinto, where there entered in 1897, 50 sea-going vessels with a tonnage of 39,520. The arrivals of coasting vessels numbered 161 of 148,662 tons.

In a report written in July, 1899, the British consul in Nicaragua gave the following statistics for the commerce of 1897 and 1898. The amounts given are in United States gold. The total exports and imports in 1897 amounted to \$2,975,720 and \$2,571,116 respectively; total exports and imports for 1898, \$3,098,231 and \$2,789,366 respectively. The leading countries to which Nicaraguan produce is exported are Great Britain, the United States, Germany, and France, to all of which except Germany the 1898 export was larger than that of 1897. The decrease in the export to Germany was due to the falling off in the quantity and price of coffee. In the import trade for 1898 Great Britain was first, with 41½ per cent. of the total, the United States and Germany ranking next with 24½ per cent. and nearly 18 per cent. respectively; these percentages are larger than those for the preceding year, but the imports of France show a decrease. According to this same report, there were exported in 1898, 400,000 pounds of rubber, 2,000,000 bunches of bananas, 500,000 cocoanuts, and 5000 ounces of gold, and 120,000 bags of coffee, a decrease in a year of 34,000 bags. Of the coffee export 70 per cent. went to Germany and 20 per cent. to Great Britain.

Communications.—There are in Nicaragua, as in most Latin-American countries, very few good roads. There are two railways in operation, one 58 miles in length, from Corinto to Momotombo, and the other, 33 miles, from Managua to Granada. The government has under construction a railway from Masago to the small town of Jinotepe; this will effect communication between some of the coffee districts and Corinto. There are about 120 post-offices, and about 60 telegraph offices, with some 1250 miles of wire.

Insurrection.—During February, 1899, a revolutionary attempt was precipitated by General Juan Pablo Reyes, commandante of the Atlantic coast district of Nicaragua. The administration of President Zelaya had levied new taxes, largely upon business men, and had demanded that the payment of all taxes be in gold instead of paper currency; at the same time only a small part of the coast revenues were used in the development of that part of the country. So great was the discontent thus aroused that the president, fearful of an uprising, prohibited the importation of ammunition and firearms; in providing for the carrying out of this order he ignored General Reyes, who, thus piqued, secured a following, and, it is said, the approval of the foreigners on the coast, and starting an insurrection proclaimed himself commander-in-chief at Bluefields on February 3 and declared war against the government. Reyes

in a short time gained control of the coast region, but was unable to hold Greytown, where, a counter-rebellion developing, the government authorities came into power. So great, however, was the disaffection that on February 10 President Zelaya sent 1000 well-equipped troops toward Rama to check General Reyes, and declared the Atlantic coast districts in a state of siege and closed the eastern ports. The rebellion was practically ended about February 26, when the gunboat *San Jacinto* was taken from the insurgents, and General Rueling, leading the government forces, captured a number of important points, including a hill commanding Bluefields. During this time American and British interests had been guarded by the United States gunboats *Marietta* and *Machias* and the British second-class cruiser *Intrepid*. About the time of the success of the government troops near Bluefields the British and American commanders addressed a communication to President Zelaya, guaranteeing to disarm the insurgents on condition that their lives and property be safe. Accordingly, on February 28 General Reyes surrendered to the commanders, who had landed with marines from the *Intrepid* and *Marietta*. After order was restored the marines re-embarked. Reyes went to the British consulate for protection, whence he embarked for Bocas del Toro, Costa Rica. Among his supporters were a number of Americans who, it was said, had served with the "Rough Rider" regiment in Cuba. Disturbances again arose at the end of March, when General Rueling, leading some of the inhabitants of Leon, was reported to have captured and held for a time a number of towns near the San Juan River and Lake Nicaragua. A number of other attempts were made against the Zelaya government, but all were successfully repressed. A state of unrest, however, existed in Nicaragua, and the financial condition was such that in July the president issued an order for an immediate forced loan of \$500,000. The conciliation between General Reyes and President Zelaya seems to have been merely nominal, for in September, 1899, a court-martial at Managua sentenced Reyes and several of his conspirators to death. Since, however, the condemned men had escaped from the country, there is little likelihood that the punishment will be inflicted.

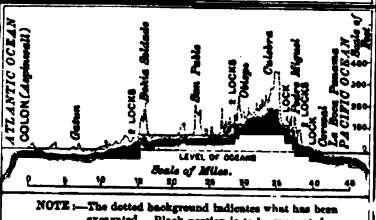
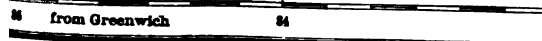
Customs Trouble.—Subsequent to the Reyes rebellion trouble arose between the American residents at Bluefields and the government over the forced payment of double customs duties. The American merchants stated that during the rebellion they were forced to pay import duties to the insurgent government; when order was restored and General Torres assumed command of the department of Bluefields, the Americans were obliged to make second payments to the regular government. To protect the interest of the Americans and to emphasize their protest, the United States cruiser *Detroit* was sent to Bluefields, and in May was replaced by the gunboat *Vixen*. General Torres was relieved of his command by the Zelaya government, and on May 6 a temporary arrangement regarding the claims of the merchants was made.

Archaeological Researches.—In 1899 a scientific commission sent out by the Danish government, and under the leadership of Dr. Johannes Neuhaus and Professor Haffau, both of Copenhagen, made investigations in prehistoric remains which are rather abundant in Nicaragua. The investigators, who returned to Denmark with about twenty tons of specimens, expected to return and continue their researches. Dr. Neuhaus believed that he had discovered a close relationship between the prehistoric civilizations of Nicaragua and Peru. Middens, ruins along the coast and the river Rama, and several old Toltec mines were visited by the party; the middens, which are particularly rich in relics, though most of the specimens found are naturally broken or worn, are situated at Kukra Point, near Bluefields. No metal implements were discovered, "but the stone hatchets and other tools were as admirably made as were the bronze tools of the Aztecs."

NICARAGUA CANAL, THE, continued during 1899 a subject of discussion both in Congress and the press.

Canal Commissions.—A synopsis of the report of the Nicaragua Canal commission under Rear-Admiral John G. Walker, appointed pursuant to an act of Congress of June 4, 1897, was given out by the Department of State, May 31, 1899. The commission reported unanimously in favor of the Childs route, first surveyed in 1852, from the Pacific to Lake Nicaragua, and the Lull route, surveyed in 1873, from the lake to the Caribbean Sea. The Childs survey, "leaving Brito, follows the left bank of the Rio Grande to near Bueno Retiro, and crosses the western divide to the valley of the Lajas, which it follows to Lake Nicaragua." The Lull survey, beginning at the head of the San Juan River, "follows the upper river to near Boca San Carlos; thence, in excavation, by the left bank of the river to the San Juanillo and across the low country to Greytown, passing to the northward of Lake Silico." The requirement of but one dam, with regulating works at each end of the summit level, is one of the advantages of the route recommended. "The surveys have in general revealed better physical conditions than were hitherto supposed to exist, especially as to the amount of rock in the upper river, whereby it is possible greatly





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OLD PROVIDENCE I.
C A R I B B E A N
S E A
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COURTOWN B.C.
ALBUQUERQUE CRY

The level of the Caribbean Sea at Chagres is 6 ft. 6 in. higher than the level of the Pacific Ocean at Panama at low-water.



to reduce the estimated cost of construction." As to the cost of construction, the opinions of the commissioners were not so concurrent, the estimate of Admiral Walker and Professor Haupt being a sum not exceeding \$118,113,790, while that of Colonel Hains was \$134,818,308. It is said that these estimates were derived from computations based on "the actual prices for excavation on the Chicago Drainage Canal and for the government locks at Sault Ste. Marie, to which certain percentages were added to allow for differences in climate and location." The estimates were made with reference to a canal with a depth of at least 30 feet throughout.

On March 3, 1899, Congress passed an act providing for the appointment by the President of a new commission, which should make another investigation of both the Nicaragua and the Panama routes, for the purpose of which the sum of \$1,000,000 was appropriated. An investigation of the work already done toward canal construction (the work of the Maritime Company and of the Panama Company) was authorized, and an inquiry ordered concerning the cost of purchasing existing rights and franchises. "And generally the President is authorized to make such full and complete investigation as to determine the most feasible and practicable route across said isthmus for a canal, together with the cost of constructing the same and placing the same under the control, management, and ownership of the United States." In the spring of 1899 there was a revival of interest in the Panama route, which finally manifested itself in this bill. It was alleged by the proponents of a canal through Nicaragua that this revival was merely an obstructionist measure directed against any trans-isthmian waterway. On June 9, 1899, President McKinley appointed the following commission: Rear-Admiral John G. Walker, U.S.N., chairman; Mr. Samuel Pasco, former United States senator from Florida; Mr. Alfred Noble, C.E., of Illinois, who was a member of the Ludlow commission; Mr. George S. Morrison, C.E., of New York, an ex-president of the Society of Civil Engineers; Colonel Peter C. Hains, U.S.A.; Professor William H. Burr, of Connecticut, head of the department of engineering in Columbia University; Lieutenant-Colonel Oswald H. Ernst, U.S.A., formerly superintendent of the United States Military Academy at West Point; Professor Lewis M. Haupt, C.E., of the University of Pennsylvania; Professor Emory R. Johnson, assistant professor of transportation and commerce in the University of Pennsylvania. It may be noted that, as in the preceding commission, Rear-Admiral Walker is chairman, and that the other two members of that commission, Professor Haupt and Colonel Hains, are included in the new one. Since 1895 there have been three engineering commissions appointed under authority of Congress for investigations of the Nicaragua route. These were the Ludlow commission, of which General William Ludlow was chairman, authorized by an act of January 28, 1895, and for which there was appropriated the sum of \$26,176; the Walker commission, authorized by an act of June 4, 1897, as noted above, and for which the appropriation was \$300,000; and the second Walker commission, the appropriation for which was \$1,000,000. It was thought that a period of two years would be required before the final report of this last commission could be submitted. At the close of the year the commission was actively at work in Nicaragua.

The Nicaraguan Companies.—At the end of 1899 the canal concessionaires occupied an anomalous position. The ten-year concession granted by Nicaragua to the Maritime Canal Company expired on October 9, 1899, on which date the new concession granted to the Cragin-Eyre Company on October 31, 1898, is alleged to have taken effect. The Nicaraguan government defended its position on the ground that the maritime company failed to fulfil its contract to finish the construction of the canal within ten years. The company insisted upon its right to an extension of time, basing its claims on the statement that during the years of its concession there had been several financial panics, that ten revolutionary movements had taken place in Nicaragua, and that after the appointment of the first Walker commission the United States government had forbidden canal construction. The government of Costa Rica seemed to concur with the company, and refused to negotiate with the Cragin-Eyre Company. The Nicaraguan government finally appointed an arbitrator to determine whether the Maritime Company was entitled to an extension of its concession.

Current Opinion on the Canal Project.—During the year discussion, based on fairly reliable data, has been largely concerned with the engineering aspects of the subject, while that relating to the commercial and military questions involved has got little beyond the phase of hypothesis and generalization. While in America the consensus of opinion seemed to be that the United States government should build, own, and operate the canal, its neutrality was also insisted upon, so that both the merchant ships and the navies of all nations should pass through on equal terms. It was claimed by many, however, that in case the United States were at war with a stronger naval power this plan would be disastrous to the former. They held that it was decidedly unwise for the United States government not to insist that after having built the canal it have the right to exclude therefrom the war-ships of

a hostile nation. Moreover, it was argued that the constant political uncertainty in Central America made it necessary to have the entire line of the canal guarded by an American force. It thus seemed clear to a number of writers that the principle of absolute neutrality from the military point of view is untenable. On the other hand, the neutrality of the Suez Canal was pointed out and used as an argument for neutrality in Nicaragua.

There was much disagreement in regard to the commercial prospects of the canal. While in most quarters the belief prevailed that the shipping passing through the canal, diverted from other routes and created by a new, shorter, and cheaper route, would yield a revenue in tolls covering the cost of maintenance, it was held by others that the commercial prospects of the canal were by no means reassuring. Pertinent to this argument are the increased facilities of the trans-continental railways and their great reduction of freight rates.

The Clayton-Bulwer Treaty.—No small part of the discussion in 1850 concerning the Nicaragua Canal pertained to the Clayton-Bulwer treaty, which was regarded as a serious obstacle to exclusive American control of the proposed canal. Space is lacking for a discussion of the controverted points, but for convenience of reference we outline here the events that led to its adoption, and quote its more important articles. Toward the close of the eighteenth century a British settlement was made in Balize. Before this time the British authority had been extended over the Mosquito territory, but in 1814 this was abandoned according to the treaty of Madrid. Subsequently, however, Mosquitia was brought under the protection of the superintendency of Balize; an English settlement, Greytown, was made at the mouth of the San Juan River, and the district thereabout was forced from Nicaragua. This trouble with Nicaragua occurred in 1848. Great Britain thus commanded one of the two possible trans-isthmian waterways. The British policy, it should be noted, both in extending England's authority westward to the Pacific on Canadian soil, and in occupying a strategic position in Central America, was one of imperialism, the object being constantly to shorten the distances and to make communication easier between her colonies. It was this idea that recommended to England the Nicaragua Canal. On the other hand, the canal seemed desirable to the United States merely on economic grounds as affording a less difficult route from the Atlantic to the Pacific shores. The desirability of such a route was emphasized by the annexation of Mexican territory and the discovery of gold in California. It was to facilitate the construction of a trans-isthmian canal that on April 19, 1850, an Anglo-American treaty was signed by John M. Clayton, secretary of state, and Sir Henry Lytton Bulwer, British minister at Washington, and it is this treaty that to Americans has been one of the most annoying barriers to a realization of the canal. The two most important articles, I. and VIII., of the treaty are as follows:

ARTICLE I. The governments of the United States and Great Britain hereby declare that neither the one nor the other will ever obtain or maintain for itself any exclusive control over the said ship-canal, agreeing that neither will ever erect or maintain any fortifications commanding the same or in the vicinity thereof, or occupy or fortify or colonize or assume or exercise any dominion over Nicaragua, Costa Rica, the Mosquito coast, or any part of Central America; nor will either make use of any protection which either affords or may afford, or any alliance which either has or may have to or with any state or people for the purpose of erecting or maintaining any such fortifications, or of occupying, fortifying, or colonizing Nicaragua, Costa Rica, the Mosquito coast, or any part of Central America, or of assuming or exercising dominion over the same; nor will the United States or Great Britain take advantage of any intimacy, or use any alliance, connection, or influence that either may possess with any state or government through whose territory the said canal may pass, for the purpose of acquiring or holding, directly or indirectly, for the citizens or subjects of the one, any rights or advantages in regard to commerce or navigation through the said canal which shall not be offered on the same terms to the citizens or subjects of the other.

ARTICLE VIII. The governments of the United States and Great Britain having not only desired, in entering into this convention, to accomplish a particular object, but also to establish a general principle, they hereby agree to extend their protection, by treaty stipulations, to any other practical communications, whether by canal or railway, across the isthmus which connects North and South America, and especially to the interoceanic communications, should the same prove to be practicable, whether by canal or railway, which are now proposed to be established by the way of Tehuantepec or Panama. In granting, however, their joint protection to any such canals or railways as are by this article specified, it is always understood by the United States and Great Britain that the parties constructing or owning the same shall impose no other charges or conditions of traffic thereupon than the aforesaid governments shall approve of as just and equitable; and that the same canals or railways, being open to the citizens and subjects of the United States and Great

Britain on equal terms, shall also be open on like terms to the citizens and subjects of every other state which is willing to grant thereto such protection as the United States and Great Britain engage to afford.

NICHOLS, HENRY, captain U. S. N., died from sunstroke while in command of the monitor *Monadnock*, near Manila, Luzon, about the 8th of June, 1899. In 1861 he entered the Naval Academy at Annapolis, became an ensign in 1866, was advanced to the rank of master in 1868, lieutenant 1869, and captain in March, 1899.

NICHOLSON, HENRY ALLEYNE, M.D., D.Sc., F.R.S., Ph.D., regius professor of natural history at the University of Aberdeen since 1882, died January 19, 1899. He was the son of John Nicholson, the oriental scholar, and was born at Penrith, England, September 11, 1844; was educated at Appleby Grammar School, Göttingen, and the University of Edinburgh. After acting as lecturer for two years in the Extra-Mural School of Medicine in Edinburgh, he occupied the chair of natural history successively in the universities of Toronto (1871), Durham (1874), and St. Andrews (1875). He was Swiney lecturer on geology at the British Museum from 1877 to 1882, and again from 1890 to 1894. Among his publications are: *Essay on the Geology of Cumberland and Westmoreland*, 1868; *Monograph of the British Graptolites*, 1872; *Reports on the Paleontology of Ontario*, 1874-75; *Ancient Life-History of the Earth*, 1877; *Tabulate Corals of the Paleozoic Period*, 1879; *Structural Affinities of Monticuliporoids*, 1881; *Monograph of the British Stromatopores*; *Manual of Paleontology*; *Manual of Zoology*.

NICKEL. The domestic supply of nickel and cobalt in 1898 came from Mine La Motte, where the metal is obtained as a by-product in lead-smelting. 11,145 pounds of nickel were produced in 1898, or less than half that of 1897. The value was \$3956. Canada continues to be an important source of nickel ore. The nickel imports in 1898 were valued at \$1,534,262. The foreign production of nickel is given as:

	Pounds.	Value.
Canada.....	5,517,690	\$1,820,838
	Metric tons.	
France.....	1,245	704,425
Germany (1897).....	898	710,980

NICKEL STEEL. The value of adding about three per cent. of nickel to steel has been found to give it such additional desirable qualities that at the present time nickel steel finds wide application. An important use now is in the manufacture of high-grade bicycle tubing, for armor, owing to its hardness, and for various marine-engine forgings, such as crank-shafts, etc.

NIGER COAST PROTECTORATE or SOUTHERN NIGERIA, a British protectorate since 1884, occupies that part of the west coast of Africa between the British crown colony Lagos and Cameroon, German territory, excepting that part of the coast-line which lies between the Forcados and Brass Rivers, and which belongs to the Niger territories. Its boundaries have not yet been permanently determined, but now include the Niger delta, the entire Benin region, and the Cross River, from the rapids to the sea. The area is between 3000 and 4000 square miles, and contains some 400 towns and villages. No trustworthy estimate of the population has been made; in 1898 the number of European inhabitants was 206. The protectorate is administered by a British imperial commissioner and consul-general (Sir Ralph Dinham Rayment Moor, K.C.M.G., since 1896), and six vice-consuls; in addition there are native councils in each of the eleven districts of the country, and about fifteen minor native courts. The capital is Old Calabar, with a population of about 15,000. There are three missionary societies, and various schools receiving government aid have been established. The revenue is chiefly derived from customs. For the fiscal year 1898 the revenue and expenditure were £153,181 and £145,440 respectively; for the fiscal year 1899 the revenue amounted to £169,567. The leading exports are palm oil, palm kernels, rubber, ebony, ivory, camwood, indigo, gums, barwood, and hides; among the chief imports are cotton goods, hardware, cutlery, spirits, and provisions. The imports and exports for the fiscal year 1898 amounted to £639,698 and £750,223 respectively; for the fiscal year 1899, imports, £732,639, exports, £774,647. The trade is chiefly with British merchants, the majority of whom in 1889 formed themselves into the African Association, Limited, of Liverpool. The centres of trade are Old Calabar, Bonny, New Calabar, Brass, Benin, Opobo, Warri, and Sapele. Akassa, at the mouth of the Niger, should also be included, as it was decided that on January 1, 1900, that town should pass from the administration of the Royal Niger Company to that of the protectorate. It was also stated that in the future the protectorate will be called Southern Nigeria.

NIGER TERRITORIES, or NIGERIA, in British West Africa, passed from the control of the Royal Niger Company at the close of 1899 to the ad-

ministration of the British Colonial Office as a recognized protectorate of Great Britain. By the Anglo-French treaty, agreed to in 1898 and ratified in 1899, whereby a readjustment of the frontier on the north and west was brought about, the total area of the territory was reduced from 500,000 square miles to about 350,000 square miles. The population of the Niger territories in 1898 was estimated at from 20,000,000 to 35,000,000.

The Royal Niger Company.—The Niger Company, whose charter dates from July 10, 1886, resulted from the amalgamation of various trading concerns in the Niger districts, by which, together with at least 500 different treaties with natives and native kings, it gained control of the vast territory which has been administered by it under the name of the Niger Territories. By Anglo-French and Anglo-German agreements in 1886, 1890, and 1893, its limits were fixed so as to include a territory of about 500,000 square miles, not only controlling the mouth of the Niger River, but having sovereign power over Sokoto, a dependent empire, with an area of 219,500 square miles, and a population of 15,000, which includes the kingdom of Gando in the middle Niger Valley. This portion of the Soudan is well peopled, the Fulahs being the dominant race. West of Sokoto lies the Borgu country, in which the company obtained rights similar to those exercised over Sokoto. The Royal British Company has supported its sovereignty in western Africa by its own army and navy, and has made and declared wars and treaties. Its military success has been notable, and it has practically subdued that part of Africa taken up by it. However, portions of the Niger country have long been looked upon with envy by other nations than Great Britain, and some British authorities have felt that the danger of foreign invasion, as well as some other matters, such as the development of common trade, the extension of effective rule, etc., could best be met if Nigeria were under the direct control of the home government, rather than under the administration of a commercial company, however efficient it might be.

Boundary Changes.—By the Anglo-French agreement, ratified in 1899, neither country obtained all that it claimed, but the French gained the advantage, receiving territory for which no satisfactory equivalent was rendered Great Britain. The territories in dispute included mainly the hinterlands of Lagos and Dahomey, and of the Gold Coast and the Ivory Coast. By the new treaty the line of delimitation starts at the Dahomey-Lagos boundaries, crosses the Niger ten miles above Ilo, so as to include the Borgu country within British territory, and gives France jurisdiction over Gurma and the station of Nikki, while excluding her from Bussa, Ilo, and other posts which she had seized. From the Niger the line runs northeast, transferring to the French a triangular tract of land between the port of Say, Mauni, and the Niger. It then curves beyond the former boundary so as to unite to Nigeria a tract of land north of Sokoto, and meets the German frontier in the middle of Lake Tchad, in the northeast corner of Nigeria. In the disputed area in the hinterland of the Ivory and Gold Coast, the western branch of the Volta River was made the boundary between the hinterlands of the two settlements, and the eleventh parallel the boundary between the British, or Gold Coast, hinterland, and the French Soudan territory in its rear. The adoption of the Volta River line gave France a strip theoretically belonging to the British, who were forced to evacuate the towns of Dokta and Bona, and the eleventh parallel boundary gave to France the rich territory of Mossi. The commercial conditions of the treaty gave France a thirty-year lease of two areas on the Niger, where French goods may be stored free of duty preparatory to transportation into French territory. Great Britain was conceded a period of thirty years' free trade in the French colonies between Liberia and the Niger.

Administrative Changes.—The assumption of authority over the Niger territories on the part of the British government was to take place January 1, 1900, when a complete administrative reorganization was to be brought about. The area formerly administered by the Royal Niger Company was to be divided into the protectorate of northern Nigeria, including all the company's territory lying north of Ida on the Niger, the boundary of Lagos meanwhile being moved eastward to include additional coast-line. The southern portion of the Niger territories was to be incorporated with the Niger Coast Protectorate, as a protectorate under the name Southern Nigeria. The area of Northern Nigeria will be about 300,000. Jeba will be the present capital, with the probable future seat of government at Lokoja, at the junction of the Niger and the Benue. This protectorate, the largest and most important on the west coast of Africa, will be under the governorship of Lieutenant-Colonel F. D. Lugard. Colonel J. Willcocks, military commandant of Northern Nigeria, will act as commissioner and commander pending the arrival of Colonel Lugard. While North and South Nigeria and Lagos will be separated for administrative purposes, the whole protectorate will be known as Nigeria.

Details of the Transfer of the Niger Territories.—The British government made public in June, 1899, the reasons which led to the decision to take over the formal administration of the Royal Niger Company's territories. These were, briefly, the

advisability of direct imperial control over the frontier and commercial policy of Nigeria, and of the West African frontier forces, and the desirability of changing the situation whereby the company had a practical monopoly of trade. An arrangement was drawn up between the company and the British Treasury by which the former agreed to transfer to the government its administrative powers, and its treaty, land, and mining rights. It agreed also to transfer to the government its materials of war and its administrative buildings, and also a certain proportion of its plants, including docks and warehouses, steamers, buildings and lands at stations, etc., for which the Treasury agreed to pay to the company the sum of £115,000. In addition the government agreed to pay £150,000 as compensation for the rights surrendered by the company, and for the interruption of the latter's business, and £300,000 for the development which the company had brought about in the condition of the Niger territories, aside from its civil administration. It was decided to impose a royalty on certain mineral rights, one-half of which should go to the company. The total amount to be paid for the company's lands and rights is stated to be about \$4,325,000. Finally the British government agreed to assume liability on the public debt of about £250,000 which the company has maintained in Algeria. It is announced that the company will continue as "The Niger Company, Limited," embracing as heretofore the general lines of trading and banking, the working of mines and forests, and the cultivation of various native products, such as indigo, etc.

The Niger Trade.—The principal benefits coming to Great Britain from the administration of the Niger Company are thus far the establishment of order in the territories, their exploration, the putting down of slave-trading and slave raids, the lessening of the liquor traffic, and the many treaties, commercial and political, which have been made with the various kings and chiefs. Trade in the inland territories is comparatively small at present, but is capable of great development. There are many large centres of population and important market towns in the territories, some of which are Bida, with a population of 90,000; Yakoba and Florin, 50,000, and Kano, 35,000. The Niger River is navigable for steamers from the coast to the heart of the continent. Excluding Lagos and the Niger Coast Protectorate (*qq. v.*), the trade of the Niger country consists, for exports, principally of gum, hides, india rubber, ivory, palm oil, and vegetable butter. The cultivation of coffee and cocoa has been started, and a botanic garden is said to have been created. The chief imports are cottons, silks, woollens, earthenware, hardware, beads, tobacco, and salt. Owing to the fact that the Niger territories have not been classed as a British colony, no official statistics exist as to the amount of trade annually carried on. However, the work of the Niger Company has paved the way for the growth of a considerable commerce for the future. The credit for this is largely due to the energy and foresight of Sir George T. Goldie.

NISBET, JOHN FERGUSON, English journalist, died April 2, 1899. He was born in Lanarkshire, October 28, 1851; was educated at Glasgow University. He contributed to many periodicals; for many years he wrote special articles for the *London Times*, and from 1882 to the time of his death was dramatic critic on that paper. He published *The Insanity of Genius*, a psycho-physiological treatise.

NITROGEN THERMOMETER. See PHYSICS (paragraph Comparison of Platinum and Nitrogen Thermometers).

NOBLES OF THE MYSTIC SHRINE. See MYSTIC SHRINE, NOBLES OF THE.

NON-INFLAMMABLE WOOD. Wood rendered non-inflammable by being impregnated with certain chemicals is now manufactured on a commercial scale in both England and America. As conducted at the two principal American works, the process consists, first, in steaming the wood to soften the fibres and open the cells; second, in exhausting all the moisture from the wood, and, third, in forcing the adopted chemical into the wood to take the place of the moisture, which has been extracted. These operations are conducted in succession in a large steel cylinder which can be closed hermetically. After being removed from the cylinder the treated wood is seasoned and then ready for use. The principal use of non-inflammable wood so far has been in the finish and fitting of war-ships. It has been introduced into fire-proof building construction, however, and there seems to be a favorable field for its extended use for this and other purposes.

NORTH CAROLINA, a South Atlantic State, has an area of 52,250 square miles. Capital, Raleigh.

Mineralogy.—The most valuable mineral industry in the calendar year 1898 was quarrying, which yielded granite, valued at \$79,969; sandstone, \$9100, and limestone, \$1605—total, \$90,674. In iron ore North Carolina and Georgia together produced 79,125 long tons of red hematite, 78,869 of brown hematite, and 2089 of magnetite—total, 160,083 long tons, valued at \$129,468, a decrease in a year of 44,556 long tons. There was a notable gain in gold and silver mining, the output being, gold, 4064

fine ounces, valued at \$84,000; silver, 700 fine ounces, coining value, \$905—total, \$84,905, an increase of \$49,917. The single coal mine in operation yielded 11,495 short tons, valued at \$14,368, a large decrease, caused by a fire in the mine. Copper mining at Virgilina, just over the Virginia line, was chiefly in the line of development. The ores are a rich sulphide, containing a good deal of mineral as rich as glance, occurring in quartz and quartite. During the year a plant for smelting these ores was completed at West Norfolk, Va., and a company was organized to develop copper property near Gold Hill. In 1899 a rich bed of ore was discovered near Salisbury, carrying both gold and copper, and new veins of copper were found on the rocky corn and tobacco farms in the vicinity of Virgilina. What was pronounced to be the finest deposit of magnetic iron ore in the Southern States exists in Ashe County, and in November a tract of 10,000 acres was leased by two Pennsylvania steel companies, and railroad extensions to the seat of operations were ordered.

Agriculture.—In the cotton year ending August 31, 1899, the area in cotton was 1,311,708 acres, and the production 629,620 gross bales, and for the year 1899-1900 the area was 1,220,000, and the estimated yield 193 pounds of lint cotton per acre.

Manufactures.—During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$4,921,016. There were 201 manufacturers of tobacco and 38 of cigars, and the combined output in the calendar year 1898 was 8,482,148 cigars, 20,940,896 pounds of plug tobacco, 12,044 pounds of fine cut, 9,239,870 pounds of smoking, and 48,552 pounds of snuff. Grain and fruit distilleries in operation numbered 1488; the amount of fruit brandy produced was 38,557 gallons; spirits rectified, 524,158 gallons; distilled spirits gauged, 2,358,425 gallons, and fermented liquors produced, 107 barrels. There was another noteworthy advance during 1899 in cotton manufacturing. The new plants put into operation numbered 28, and new spindles, 230,168, with an estimated capitalization of \$8,000,000. See COTTON AND THE COTTON INDUSTRY.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Pamlico and Wilmington aggregated in value \$145,260; exports, \$7,590,381—total foreign trade, \$7,735,641, a decrease in a year of \$43,037 in imports and \$2,174,218 in exports; net decrease, \$2,217,255.

Railways.—The new railway construction in the calendar year 1898 was 123.10 miles, and in 1899, 80.30 miles, giving the State a total mileage of 3653.57. The assessed valuation of railway property in 1898 was \$33,619,868, an increase in a year of \$4,462,769. An act of the legislature went into operation on April 4, 1899, which in place of a railway commission established a corporation commission to have control of all railways, banks, and building and loan associations in the State. Interested parties at once entered suit in the courts to test the constitutionality of the law.

Banks.—On October 31, 1899, there were 29 national banks in operation and 11 in liquidation. The active capital aggregated \$3,001,000; circulation, \$1,086,234; deposits, \$7,306,247, and reserve, \$1,822,175. The State banks, June 30, 1899, numbered 45, and had capital, \$2,029,898; deposits, \$5,424,085; resources, \$8,558,017, and surplus and undivided profits, \$543,906; private banks, 16, with capital, \$197,400; deposits, \$898,821; resources, \$1,350,262, and surplus and profits, \$143,558; and stock savings banks, 5, with capital, \$80,000; deposits, \$1,218,319, and resources, \$1,367,212.

Education.—Incomplete returns of the school census of 1898 showed a total enumeration of 613,802. At the close of the school year 1897-98, the enrolment in the public schools was 399,375, and the average daily attendance 214,540. There were 7217 teachers, 6817 buildings used as school-houses, and public school property valued at \$970,675. The revenue was \$986,514; expenditures, \$931,143, of which \$761,772 was for teachers' salaries. There were 14 public high schools, with 37 secondary teachers, 892 secondary students, and 387 elementary pupils; 111 private secondary schools, with 301 teachers, 5142 secondary students, and 7013 elementary pupils; 7 public normal schools, with 61 teachers and 1807 students in all departments; and 8 private ones, with 75 teachers and 1751 students. Normal training was also given in 5 colleges. Fifteen universities and colleges for men and for both sexes reported 198 scholarships, 181 professors and instructors, 2877 students, 110,100 volumes in the libraries, valued at \$204,000; \$33,550 invested in scientific apparatus, \$1,523,500 in grounds and buildings, and \$770,942 in productive funds; \$177,204 in total income, and \$151,573 in benefactions. Nine colleges for women reported 127 professors and instructors, 1224 students, 16,400 volumes in the libraries, \$591,000 invested in grounds and buildings, and \$16,000 in productive funds, and \$115,100 in total income. In 1899 there were 262 periodicals, of which 24 were dailies, 194 weeklies, and 28 monthlies.

Finances.—The assessed valuations in 1898 were: Real estate, \$155,280,169; personal property, \$76,067,160, and railway property, \$33,619,868—total, \$265,867,197; increase in a year, \$6,855,689; tax rate, \$4.30 per \$1000. The recognized funded debt in 1899 was \$6,090,850, and the recognized fundable debt, \$265,920—total, \$6,356,770.

Of the total, \$2,745,000 is in 6 per cent. consols, the interest on which is paid from proceeds of the lease of the North Carolina Railroad. Assessments are about 60 per cent. of cash values.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 1,855,000.

Legislation.—The State Board of Agriculture was authorized to investigate diseases of live stock, supervise trade in fertilizers, and report any dealers in the same who are members of trusts or pools. Foreign corporations may be domesticated by filing charter with secretary of state and paying legal fees. The railway commission was abolished and in its stead a corporation commission is to be elected, with large power as to fixing rates of charges in railroad, transportation, express, telephone, and telegraph lines; it will also regulate banks, trusts, and insurance companies, and will assess the property of transportation companies. An elaborate election law was passed creating a State board of elections, which appoints the county boards; all voters must be registered after payment of a poll-tax. The State Board of Agriculture is required to analyze food, and persons found guilty of adulteration will be punished; the water supply is also protected. The office of commissioner of insurance was created, with great power; also the office of commissioner of labor and printing, the incumbent to be elected. Local option for the sale of liquors was provided for, and the dispensary system was adopted as to certain counties. In the interest of good roads, a rebate of one-half the road tax is allowed to those who use broad-tire wagons. A general tax law was passed, about all occupations paying a license tax; telegraph, telephone, and express companies pay 2 per cent. on gross receipts from State business, corporations are taxed according to capital stock; all incomes derived from property not already taxed, and of over \$1000 derived from salaries or fees, are to be taxed. Formation of trusts was prohibited under heavy penalties, with forfeiture of charter, and contracts in relation thereto were declared void. A constitutional amendment fixing the suffrage for males will be voted upon at the general election in 1901; it will require of naturalized or native-born citizens a residence of two years in the State, the payment of a poll-tax for the previous year, and ability to read and write any section of the constitution in the English language. The avowed object of this amendment is to eliminate the ignorant negro vote, since there is a further provision in the interest of the white voter to the effect that any person can vote who was entitled to vote on January 1, 1867, or any time prior thereto, or whose ancestors were so entitled to vote.

State Officers and National Representatives.—Governor, Daniel L. Russell; lieutenant-governor, C. A. Reynolds; secretary of state, Cyrus Thompson; treasurer, W. H. Worth; auditor, H. W. Ayer; attorney-general, Z. Vance Walser; insurance commissioner, James R. Young; adjutant-general, R. B. Royster. Supreme Court: Chief justice, William T. Faircloth; associate justices, Robert M. Douglas, Walter Clark, D. M. Furches, W. A. Montgomery; clerk, Thomas S. Kenan. The State legislature consists of 134 Democrats and 36 Fusionists. Senators: Marion Butler (Pop.), from Elliott, and Peter C. Pritchard (Rep.), from Marshall. Representatives: John H. Small (Dem.), from Elizabeth City; George H. White (Rep.), from Tarboro; Charles R. Thomas (Dem.), from Newbern; John W. Atwater (Dem.-Pop.), from Rialto; W. W. Kitchin (Dem.), from Roxboro; John D. Bellamy (Dem.), from Wilmington; Theodore F. Klutz (Dem.), from Salisbury; R. Z. Linney (Rep.), from Taylorsville, and W. T. Crawford (Dem.), from Waynesville.

NORTH DAKOTA, a northwestern State, has an area of 70,795 square miles. Capital, Bismarck. North Dakota was admitted into the Union in 1889.

Mineralogy.—In the calendar year 1898 the State attained its maximum production of coal, with an output from 18 mines of 83,895 short tons, valued at \$93,591, an increase in a year of 6649 tons. The largest output was from 3 mines in Stark County, 45,280 tons, and the next largest producing counties were McLean and Ward, from 6 mines, and Morton, from 3. Of the total product, 71,223 tons were loaded at the mines for shipment. The average number of men employed in all mines was 151, and the average number of working days, 187.

Railways.—The new railway construction in the calendar year 1898 was 77.57 miles and in 1899, 41.16, giving the State a total mileage of 2703.15. Railway property was assessed at \$12,742,395 in 1898 and \$16,985,084 in 1899, the last an increase of \$8,212,381 over the total of 1897.

Banks.—On October 31, 1899, there were 23 national banks in operation and 20 in liquidation. The active capital was \$1,450,000; circulation, \$462,191; deposits, \$5,000,186; reserve, \$1,048,493; and resources, \$7,727,899. The State banks, July 1, 1899, numbered 106, and had capital, \$1,258,250; deposits, \$5,002,391; resources, \$6,858,194; and surplus and undivided profits, 365,785. In the year ending September 30, 1899, the exchanges at the United States clearing house at Fargo aggregated \$17,183,046, an increase in a year of \$4,064,111.

Education.—The corrected school census of 1897 gave a total enumeration of

76,651. At the close of the school year 1897-98 the public school enrolment was 67,375 and the average daily attendance, 41,155. There were 3637 teachers, 2304 buildings used for school purposes, and public school property valued at \$2,132,738. The receipts were \$1,696,368; expenditures, \$1,288,031, of which \$693,403 was for teachers' salaries. There were 24 public high schools, with 50 secondary teachers, 908 secondary students, and 12 elementary pupils; 2 private secondary schools, with 8 secondary teachers, 48 secondary students, and 304 elementary pupils; 2 public normal schools, with 19 teachers and 332 students in all departments; and 1 private one, with 9 teachers and 220 students. Normal training was also given in 1 college and 1 public high school. Three universities and colleges for men and for both sexes reported 31 professors and instructors, 611 students, 10,500 volumes in the libraries, valued at \$25,500; \$12,850 invested in scientific apparatus, \$230,000 in grounds and buildings, and \$34,000 in productive funds; \$44,300 in total income and \$14,203 in benefactions. In 1899 there were 149 periodicals, of which 8 were dailies, 130 weeklies, and 8 monthlies.

Finances.—The assessed valuations for 1899 were: Real estate, \$72,010,059; personal property, \$24,641,156; and railway property, \$16,985,084—total, \$113,636,299, an increase over 1898 of \$12,505,283, and over 1897 of \$20,164,806; tax rate for 1899, \$4.50 per \$1000. The total bonded debt, July 1, 1898, was \$845,300, none of which falls due till May 1, 1902.

Divorce Decision.—In November, 1899, the State Supreme Court rendered a decision holding that residence in the State must be *bona fide* and characterized by the intention to stay to give the litigant the benefit of the State laws concerning divorce, and that persons who go to the State for the express purpose of securing a divorce do not acquire a legal residence.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 258,000.

Legislation.—It was enacted that persons slaughtering cattle shall record description of animal and name and address of person from whom purchased, and make a monthly report to the secretary of state. Causes must be continued when any interested attorney is a member of the legislature. Corporations for religious or charitable purposes cannot acquire more than \$100,000 in value of real estate. Dairy products were placed under the control of the commissioner of agriculture: dairymen are required to take licenses, and renovated butter, oleomargarine, and filled cheese must be labelled. The office of State game warden was created, and license to hunt must be had, with fee of \$25 to non-residents and 75 cents to residents. Ten years' adverse open and undisputed possession makes title to real estate. Free text-books are provided in the schools, and physical training must be taught. Tax deeds are absolute and conclusive of the facts therein recited. Six constitutional amendments are under consideration and to be voted for: Providing for a board of pardons; that grain grown in the State, held in elevators, may be taxed at a fixed rate; that no lands other than school lands shall be sold at less than appraisal, and none less than \$5 an acre; that a State hospital for the insane and an institution for the feeble-minded be established; that the franchise, roadway, rails, and rolling stock of railroads, and all property of express, sleeping car, telegraph, and telephone companies shall be assessed at actual value, which shall be apportioned among the municipalities through which they pass; and that permanent school or educational funds may be invested in United States, State, county, school district and municipal bonds, and on farm lands to the extent of one-third of the actual value of said lands.

State Officers and National Representatives.—Governor, F. B. Fancher; lieutenant-governor, J. M. Devine; secretary of state, Frederick Falley; treasurer, D. W. Driscoll; auditor, A. N. Carlblom; attorney-general, J. M. Cowan; superintendent of education, J. G. Halland; adjutant-general, Elliot S. Miller; commissioner of agriculture, H. U. Thomas; commissioner of insurance, G. W. Harrison. Supreme Court: Chief justice, J. M. Bartholomew; associate justices, Alfred Wallin, N. C. Young; clerk, R. D. Hoskins. The State legislature is composed of 78 Republicans and 15 Fusionists. Senators, Henry C. Hansbrough, from Devil's Lake; and Porter J. McCumber, from Wahpeton—both Republicans. Representative, R. E. Spalding (Rep.), from Fargo.

NORTHUMBERLAND, sixth Duke of, ALGERNON GEORGE PERCY, died January 2, 1899. He was born May 2, 1810, and was educated at Eton. As a Conservative he represented Beeralston in Parliament in 1831-32 and North Northumberland from 1852 to 1865. In 1858 he was Lord of the Admiralty, and vice-president of the Board of Trade in 1859. He succeeded his father to the title in 1867. From 1878 to 1880 he was Lord Privy Seal. His son, Earl Percy, succeeded to the title.

NORTHWEST TERRITORIES, political designation of a vast part of British North America, under the jurisdiction of the Dominion of Canada, and besides

a large unorganized area, containing the following administrative districts: Keewatin, created in 1876, gross area, 756,000 square miles; Assiniboia, created in 1882, gross area, 90,340 square miles; Saskatchewan, created in 1882, gross area, 114,000 square miles; Alberta, created in 1882, gross area, 100,000 square miles; Athabaska, created in 1882, gross area, 251,300 square miles; Mackenzie, created in 1895, gross area, 563,200 square miles; Ungava, created in 1895, gross area, 456,000; and Franklin, created in 1895, gross area unknown. The known area of all districts is 2,330,840 square miles. In August, 1897, in consequence of the great rush to the Klondike gold region, the governor-general by proclamation established the Yukon judicial district, and in June, 1898, the Dominion Parliament rearranged the boundaries of the district and created the separate territory of Yukon, with a gross area of 198,300 square miles, and administrative centre at Dawson. Yukon territory to-day is wholly a mining region, with such interests as naturally attach to the industry; and as it is yet too young to possess the elements that would give it other importance and independent treatment, it is here considered as a part of the Northwest Territories.

Agriculture.—Returns from the various districts for the calendar year 1898 showed the following grain productions: Wheat, 5,542,478 bushels, from 307,580 acres; oats, 3,040,307 bushels, from 105,077 acres; and barley, 449,512 bushels, from 17,092 acres.

Mineralogy.—The second classified coal area of Canada is chiefly in the Northwest Territories, with an overlapping section in Manitoba, and mining operations in both regions are unified in official reports. In the calendar year 1898 the combined production was 340,088 tons, an increase in a year of 72,925 tons, and the largest output recorded. The exports were 40,434 tons. Gold-mining, the distinctive industry of the region, is confined to Yukon territory and Saskatchewan district. The remarkable development of the industry is shown by the returns of the last four years. In 1896 the production was: Yukon, \$300,000; Saskatchewan, \$55,000; in 1897, Yukon, \$2,500,000; Saskatchewan, \$50,000; in 1898, Yukon, \$10,000,000; Saskatchewan, \$25,000 (both returns for this year being subject to revision); and in 1899 the output of the entire Klondike region, excluding a number of important locations, such as Sulphur Creek, Stewart River, Upper Klondike, and Scroggie Creek, was conservatively estimated at \$19,000,000. No workings of consequence have yet been undertaken in the known great petroleum fields, nearly every possible mineral industry being subordinated to gold-mining.

Fisheries.—The value of all fishery catch in the calendar year 1897 (the last officially reported and for both the Northwest Territories and Manitoba) was \$638,416, a decrease of more than \$100,000 in a year and the lowest since 1891. The principal catch was whitefish, \$413,893; pickerel, \$117,667; pike, \$46,244; and sturgeon, \$20,831. Exports of all fisheries in 1898 amounted to \$211,748, a slight increase; and the capital investment in all fisheries to \$237,646.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise in the territories alone aggregated in value \$636,979, an increase in a year of \$346,542; exports, domestic and foreign, \$159,822; duty collected on imports, \$160,532.

Banks.—On January 1, 1899, there were 20 chartered banks and branches in the territories, including 2 in Yukon; and 25 post-office savings banks, with 1257 depositors and \$232,898 deposits.

Railways and Telegraphs.—In 1898 the total railway mileage was 1778, independent of special constructions in Yukon territory. Government telegraphs, comprising the Moose Jaw and Qu'Appelle systems, had a total length of 698 miles, all land line, with 17 offices; total expenditure, \$14,353.

Post-Offices.—At the end of 1898 the territories and Manitoba together had 796 post-offices, in which were posted during the year 10,350,000 letters and 1,250,000 postal-cards; and the territories alone had 49 money-order offices, which issued 45,304 orders.

Education.—Reports for the school year 1898 showed 426 public schools, 483 teachers, 16,754 enrolled pupils, 8827 pupils in average attendance, and revenue from the legislative assembly, \$133,643. At the end of 1899 there were 21 periodicals, of which 1 was a daily and 19 weeklies.

Finances.—Since confederation the Dominion government has expended on capital account for the territories \$3,800,126, and in 1898 it expended on consolidated fund account, for the government of the territories, \$347,687, and for the Yukon provisional district, \$47,027.

Population.—Local estimates in 1898-99 gave Regina, the seat of government, 2200; Calgary, 4310; Edmonton, 2800; Prince Albert, 1500. The Indian population of the treaty limits in the territories and Manitoba was 21,316; of the Peace River district treaty limits, 893; and of the territories outside of treaty limits, 17,648—total, 39,857. There were 60 schools for Indian youth in the treaty limits of the territories and 12 outside of those limits, with a total enrolment of 2652 pupils. The Indians

measures, leaving him to work out the details. He was premier in 1878-79, 1884-88, and 1894-95; in November of the last-named year he resigned on account of old age, and was succeeded by Mustapha Fehmy Pasha.

NUGENT, Sir JOHN, M.D., died January 26, 1899. He was born in 1806, and was educated at Trinity College, Dublin. He will be remembered for his service during a long term of years—1847-90—as inspector and commissioner of control in lunacy in Ireland. Upon relinquishing this work in 1890 he was knighted.

NURSES, TRAINED. On the evening of March 6, 1899, the twenty-fifth anniversary of the founding of Bellevue Training School, New York City, was celebrated at the Waldorf-Astoria in that city. Over 800 nurses were present in uniform, representing twenty city hospitals. In 1872 Bellevue sent out the first class of trained nurses graduated in this country, numbering five women. The second annual convention of Trained Nurses of the United States and Canada was held in May, in New York City. Delegates were present from twenty-six hospitals. The president's address was delivered by Mrs. Hunter Robb, of Cleveland, O., formerly superintendent of Johns Hopkins Training School, Baltimore, Md. The various training schools in the country sent forth the usual number of graduates during the year 1899, one only meriting special mention. A class of twenty-seven women was graduated from Johns Hopkins Training School in June, 1899, the first in the world to complete a three-years' course, without payment of fees or tuition charges, the amount of practical work having been limited to eight hours a day. More time is given to educational features in this course than in most other schools, and a high order of attainment is required at graduation.

The American Society of Superintendents of Training Schools for Nurses has used the necessary influence with the Teachers' College of Columbia University, New York City, to secure the adoption of a course of hospital economics. This course is designed to prepare nurses to become teachers in training schools for nurses and superintendents of hospitals. Applicants for the teachers' course will be carefully examined by a special board of examiners, composed of hospital superintendents. Those who are found to possess the necessary requirements, and are probably fitted to be developed into superintendents, are admitted to the course of eight months' instruction. Three or four months of private duty are also required before the final examination for the certificate as a qualified superintendent. The school opened in the fall of 1899.

In July, Surgeon-General Sternberg ordered the organization of the Army Nurse Corps, under the supervision of Dr. Anita N. McGee, and provided in the order that female nurses may be assigned by the surgeon-general to duty at army hospitals where the patients require the care of trained nurses. The corps is to consist of chief nurses, nurses, and reserve nurses. Immune nurses will not be required to sign any contract, but others will be obliged to contract with the government for a year. The schedule of pay is thus arranged: In the United States a nurse will receive \$40, and in the colonies \$50 a month. Chief nurses, who are in authority over from five to ten nurses, will be paid \$10 additional, and those over more than ten nurses will be paid \$25 additional. The surgeon-general suggests to Congress that the superintendent of the Army Nurse Corps receive \$1800 annually. In November Dr. McGee reported that the corps had been organized, with about 230 nurses in the service. The method of organization of the corps has not been altogether satisfactory to the Associated Alumnae of the United States and Canada, who had offered their services to the government in the spring of 1898, when the possibilities of war with Spain menaced the nation, without receiving reply or attention. Their contention has been, and very properly, that the army nurses should be chosen only after affording some guarantee of fitness, and the corps should be organized from a strictly business standpoint. Instead of being put into the hands of the Alumnae organization, the matter of creating the corps was put into the hands of the Society of the Daughters of the American Revolution. While satisfied in the main with the result, the Alumnae consider that certain features of the service will be improved if a few changes are made. Hence, they have prepared a bill, which was to be presented to the House of Representatives in January, 1900. The following are some of the provisions of this bill: Women nurses, in the proportion of not more than 10 per cent. of the number of sick and wounded in general and post hospitals of fifty beds and upward, shall be employed by and constitute the women's nursing service of the medical department of the army. The superintendent of the women nurses in the army shall be a woman graduated from a general hospital training school for nurses, having a course of instruction lasting not less than two years, and who shall be appointed by the secretary of war, her salary to be \$2000 per annum. The nurses employed shall be graduates of general hospital training schools. Chief nurses shall be paid \$75 a month in the United States, and \$85 in the colonies. In addition to salary, each nurse, as well as the superintendent, shall receive travelling expenses

and necessary expenses when under proper orders, and they shall have quarters, subsistence, laundry for uniforms, medical attendance during illness, as well as nursing and medicines, and they shall be granted such leave of absence, without loss of pay, as the secretary of war may allow. That nothing in the bill shall prevent or limit the power of the secretary of war in time of war or of national disaster to avail himself of duly qualified Red Cross nurses (termed "sisters"), or of nurses of other worthy societies or associations. These provisions are all most desirable.

OATS. The following table, published by the department of agriculture, division of statistics, shows the acreage, production, and value of oats in the United States in 1899:

States and Territories.	Acreage.	Average Yield per Acre.	Production.	Average Farm Price per Ton December 1.	Farm Value December 1.
	<i>Acres.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Cents.</i>	<i>Dollars.</i>
Maine.....	141,619	35	4,956,665	38	1,883,533
New Hampshire.....	29,927	35	1,047,445	39	408,504
Vermont.....	107,009	37	3,959,333	37	1,464,953
Massachusetts.....	14,819	33	489,027	38	185,830
Rhode Island.....	3,668	26	95,368	37	35,286
Connecticut.....	18,752	28	525,056	37	194,271
New York.....	1,464,568	31	45,401,608	33	14,982,131
New Jersey.....	95,193	24	2,284,632	33	753,929
Pennsylvania.....	1,186,304	33	39,148,082	29	11,352,929
Delaware.....	16,004	20	320,080	25	80,020
Maryland.....	72,852	23	1,675,596	30	602,679
Virginia.....	307,537	14	5,145,518	33	1,698,021
North Carolina.....	398,934	12	4,787,208	41	1,962,755
South Carolina.....	251,998	12	3,023,976	47	1,421,289
Georgia.....	476,873	9	4,291,857	48	2,060,091
Florida.....	85,606	9	820,454	50	160,227
Alabama.....	301,207	10	3,012,070	43	1,295,190
Mississippi.....	136,574	10	1,365,740	50	682,870
Louisiana.....	30,738	18	553,284	40	221,314
Texas.....	682,719	25	17,067,975	30	5,120,392
Arkansas.....	313,918	19	5,964,442	34	2,027,910
Tennessee.....	390,446	14	5,326,244	39	1,704,398
West Virginia.....	137,324	28	3,158,452	35	1,105,458
Kentucky.....	455,267	18	8,194,806	32	2,622,338
Ohio.....	915,106	36	32,945,976	25	8,236,494
Michigan.....	699,972	34	20,599,048	28	5,567,733
Indiana.....	1,071,911	32	34,301,248	23	7,880,287
Illinois.....	8,349,446	38	127,378,948	22	28,001,369
Wisconsin.....	1,880,205	36	67,687,380	23	15,568,097
Minnesota.....	1,646,513	32	52,688,416	22	11,591,452
Iowa.....	3,848,053	33	126,965,749	19	24,127,292
Missouri.....	811,974	25	20,299,350	24	4,871,844
Kansas.....	1,349,290	29	39,129,410	21	8,606,470
Nebraska.....	1,715,801	30	51,474,120	22	11,324,306
South Dakota.....	589,708	26	15,332,278	23	3,526,424
North Dakota.....	599,549	30	17,987,670	27	4,856,671
Montana.....	60,986	38	2,317,468	39	903,813
Wyoming.....	14,743	30	442,290	40	176,916
Colorado.....	90,698	27	2,448,846	42	1,028,515
New Mexico.....	7,418	24	178,032	44	78,334
Utah.....	25,054	34	872,236	40	348,894
Idaho.....	82,352	34	1,099,968	38	417,988
Washington.....	81,945	37	3,081,965	38	1,152,147
Oregon.....	170,622	30	5,118,669	41	2,098,651
California.....	59,477	31	1,843,787	47	866,590
United States.....	26,341,380	30.2	796,177,713	24.9	198,167,975

OCBRE. The production of ochre, umber, and sienna in 1898 came chiefly from twelve States, and amounted to \$143,257. Pennsylvania yielded over 50 per cent. of the output, while Georgia and Vermont were other important producers. Maryland produced 640 tons of the color known as Spanish brown, which was not produced by any other State.

ODD FELLOWS, INDEPENDENT ORDER OF, was organized in England in 1812, and in the United States in 1819, the first lodge in this country being established in Baltimore, Md. Mutual assistance is the primary object of the order. For the year ending December 31, 1898, the total relief paid was \$3,422,986.50; brothers relieved, 98,277; widowed families relieved, 5854; paid for relief of brothers, \$2,612,303.25; for widowed families, \$145,078.35; for education of orphans, \$40,996.89; for burying the dead, \$624,608.01. The membership, including the grand lodges of Australasia, Germany, Denmark, Sweden, and Switzerland, but not including female members, is 829,669. An English order, entitled the Manchester Unity of Odd

Fellows, and numbering 900,668, is not in affiliation with the American organization. The Encampment branch numbers 128,267 members. Rebekah lodges, sisters, 190,007; brothers, 123,156; chevaliers of the Patriarchs Militant, 16,169. Grand sire of the sovereign grand lodge, A. S. Pinkerton, Worcester, Mass.; grand secretary, J. Frank Grant, Baltimore, Md.

OGLESBY, RICHARD JAMES, ex-governor of Illinois, died at home in Elkhart, Ill., April 24, 1899. He was born at Oldham, Ky., July 25, 1824. In 1836 he moved with an uncle to Decatur, Ill., where he subsequently worked as a farm hand and carpenter. At the age of twenty he began to study law in the office of Judge Silas W. Robbins in Springfield, and in the fall of 1845 was licensed to practise. He commenced practice in Sullivan, but soon returned to Decatur. He then served through the Mexican War, participating in the battles of Cerro Gordo and Vera Cruz. He resumed his law practice, and in December, 1848, entered the Louisville Law School, receiving his diploma therefrom in the following spring. From 1849 to 1851 Oglesby was a gold-seeker in California, returning in the latter year to Decatur with about \$4500 as the result of his experiences. In 1858 he ran unsuccessfully for Congress, but in 1860 was elected to the State Senate. He resigned at the outbreak of the Civil War to become colonel of the Eighth Illinois Volunteers. He commanded a brigade at the capture of Fort Henry and Fort Donelson, and in March, 1862, was promoted for gallantry to the rank of brigadier-general of volunteers. In November of that year he became a major-general of volunteers. He fought under General Grant at Shiloh, and under General Halleck and General Rosecrans at Corinth, and he participated in the engagement at Pittsburg Landing. In the siege of Corinth he was so severely wounded that he was unfit for duty until the following April (1863), when he was assigned to the command of the Sixteenth Army Corps. In May, 1864, he resigned his commission, and in November of the same year was elected, as a Republican, governor of Illinois; he at once showed great activity in carrying out war measures. At the close of the war he visited Washington, arriving there on the 14th of April, the day on which President Lincoln was assassinated. He stayed with the President during the night of his death, and accompanied the funeral cortege back to Springfield. In 1864 General Oglesby had been elected governor by 30,000 majority; he was renominated in 1872, and this time received a majority of 40,000. Shortly after the assembling of the legislature he was elected to the United States Senate; he accordingly resigned the governorship and served until 1879 at Washington. In 1884 he was elected for the third time governor of Illinois; his term expired in 1889, after which time he lived on his farm near Elkhart.

O'HARA, Rt. Rev. WILLIAM, bishop of the Roman Catholic diocese of Scranton, Penn., died at Scranton, February 5, 1899. He was born in 1817 in County Derry, Ireland; after his education at Georgetown College and at Rome, he was ordained to the priesthood, becoming rector of St. Patrick's Church in Philadelphia, in which position he remained until 1856. For a time he taught in the Seminary of St. Charles Borromeo. In 1860 he was made vicar-general of the diocese of Philadelphia, and when from this the diocese of Scranton was formed in 1868 he became its bishop.

OHIO, an east central State of the United States, has an area of 41,060 square miles. The capital is Columbus. Ohio was admitted to the Union in 1803.

Mineralogy.—The maximum production of coal in the State was reached in 1898, when there was an output from 431 mines of 14,516,867 short tons, valued at \$12,027,336, an increase in a year of 2,319,925 tons. The most productive counties in their order were Perry, Jackson, Athens, Guernsey, Hocking, and Belmont. In the production of salt the State fell from third to fourth place, Kansas gaining third rank, although with an output of 1,682,247 barrels, valued at \$826,868, Ohio had an increase in the year of 106,833 barrels. Quarrying yielded sandstone to the value of \$1,494,746, a decline, and limestone, \$1,673,160, the highest since 1894. The greater part of the limestone was burned into lime, the value of which was \$911,482; the quantity used for paving and road-making was worth \$260,957; for building purposes, \$221,440, and for flux, \$210,000. The total output of iron ore was 43,868 long tons, valued at \$50,518, all carbonate ore, in the production of which the State held first place.

Manufactures.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$21,341,065, the fifth largest amount among the States. There were 237 manufacturers of tobacco and 2324 of cigars, and the combined output in the calendar year 1898 was 518,043,756 cigars, 3500 cigarettes, 8,878,261 pounds of plug tobacco, 376,555 pounds of fine cut, 6,805,237 pounds of smoking, and 5024 pounds of snuff. Grain and fruit distilleries in operation numbered 53; the amount of fruit brandy produced was 41,839 gallons; spirits rectified, 10,503,099 gallons; distilled spirits gauged, 36,414,603 gallons; and fermented liquors produced, 2,785,489 barrels. The various iron industries showed sub-

stantial improvement, with a production of 1,986,358 long tons of pig-iron, there was an increase in the year of 613,469. The output of Bessemer steel ingots was 1,489,115 long tons; open-hearth steel, 79,888; iron and steel plates and sheets, 256,433; wire rods, 269,566; wire nails, 1,711,399 kegs; cut nails, 392,003 kegs, and all kinds of rolled iron and steel, 1,231,739 long tons. During 1899 more iron ore was received at the Lake Erie harbors than in any previous year. At Ashtabula the amount was 3,759,615 tons, the largest in the history of that harbor; at Cleveland, ranking second, 3,662,137 tons; at Conneaut, the new harbor of the Carnegie company, 2,599,180 tons; at Lorain, another new ore-receiving port, 1,212,301 tons, and at Fairport, 1,398,811 tons. Cleveland shipped 1,856,425 tons; Ashtabula, 1,151,746; Fairport, 203,228, and Conneaut, 115,039.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the port of Cuyahoga (\$1,203,196) and four other ports aggregated in value \$2,753,345; exports at Cuyahoga (\$2,175,849) and other ports, \$3,182,580—total foreign trade, \$5,930,225, an increase in a year of \$764,573.

Railways.—The new railway construction in the calendar year 1898 was 97.02 miles, and in 1899, 57.32, giving the State a total mileage of 8901.42.

Banks.—On October 31, 1899, there were 256 national banks in operation and 113 in liquidation. The active capital aggregated \$45,201,100; circulation, \$20,157,709; deposits, \$169,427,060; reserve, \$53,144,313, and resources, \$270,274,728. The State banks, April 3, 1899, numbered 155, and had capital, \$13,355,750; deposits, \$69,182,670; resources, \$87,772,790, and surplus and undivided profits, \$4,057,046; loan and trust companies, 5, with capital, \$1,150,000; deposits, \$4,204,208, and resources, \$5,954,038; private banks, 55, with capital, \$803,600; deposits, \$5,121,292, and resources, \$6,286,678; mutual savings banks, 4, with depositors, 78,944; and aggregate deposits, \$34,379,801; and stock savings banks, 5, with capital, \$527,868; depositors, 10,818; deposits, \$3,671,141, and resources, \$527,868. The exchanges at the United States clearing houses at Cincinnati, Cleveland, Columbus, Canton, Springfield, Toledo, Fremont, and Akron, in the year ending September 30, 1899, aggregated \$1,602,058,683, an increase of \$246,316,771 in a year.

Education.—The school census of 1898 gave a total enumeration of 1,198,704. At the close of the school year 1897-98 the enrolment in the public schools was 810,285, and the average daily attendance, 618,667. There were 25,256 teachers, 13,114 buildings used as school-houses, and public school property valued at \$41,428,289. The revenue was \$12,760,320; expenditures, \$12,563,949, of which \$8,588,191 was for teachers' salaries. There were 598 public high schools, with 1558 secondary teachers, 40,808 secondary students, and 13,341 elementary pupils; 54 private secondary schools, with 294 secondary teachers, 2689 secondary students, and 2514 elementary pupils; 5 public normal schools, with 42 teachers and 557 students in all departments; and 12 private ones, with 100 teachers and 6575 students. Normal training was also given in 13 colleges and 58 public high schools. Thirty-five universities and colleges for men and for both sexes reported 13 fellowships, 346 scholarships, 926 professors and instructors, 11,239 students, 434,641 volumes in the libraries, valued at \$589,248; \$442,800 invested in scientific apparatus, \$8,072,956 in grounds and buildings, and \$7,843,200 in productive funds; \$1,121,827 in total income, and \$508,314 in benefactions. Six colleges for women reported 105 professors and instructors, 575 students, 23,000 volumes in the libraries, \$21,500 invested in scientific apparatus, \$664,424 in grounds and buildings, and \$75,500 in productive funds; \$140,523 in total income, and \$9000 in benefactions. In 1899 there were 1233 periodicals, of which 163 were dailies, 805 weeklies, 182 monthlies, and 14 quarterlies.

Finances.—The assessed valuations in 1898 were: Real estate, \$1,244,817,473; personal property, \$515,439,970—total, \$1,760,257,443, an increase in a year of \$12,248,804; tax rate for both 1898 and 1899, \$2.84 per \$1000. The total bonded debt of the State in 1898 was \$1,241,665, and the irreducible State debt held in trust funds, \$4,679,228. The aggregate debt of the various counties was \$11,002,159; first and second class cities, \$69,053,693; incorporated villages, \$8,540,268; townships, \$838,286, and special school districts, \$7,568,180—total local debts, \$97,002,588.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 4,500,000.

Party Platforms.—The Republican State convention was held at Columbus, June 2, 1899, and placed at the head of its ticket George K. Nash (*q. v.*), who was generally admitted to be an excellent choice on the part of the Republicans. The platform reaffirmed the principles declared by the St. Louis platform of 1896; recounted the distresses alleged to have been caused by the last Democratic administration; endorsed the administration of President McKinley, expressing perfect confidence in its ability to solve the problem of the future of Cuba, Puerto Rico, and the Philippine Islands; commended the President for the modifications of the civil service rules recently promulgated; commended the action of the Seventy-third General Assembly of Ohio in passing the stringent law that prohibits the organization of

trusts, denouncing them as inimical to the interests of the people, and demanded the rigid enforcement of the law, and pledged the party to such further legislation as experience might determine necessary to prevent the formation and operation of such combinations. Other resolutions recommended a uniform system of selecting delegates to State conventions, and laws for equalizing taxes, protested against lynching, and strongly favored the Ohio Centennial at Toledo in 1902.

The Democratic State convention was held at Zanesville, August 30, 1899, and nominated for governor John R. McLean, proprietor of the Cincinnati *Enquirer*. The platform reaffirmed the entire Chicago platform of 1896, especially emphasizing its financial plank; expressed entire confidence in Mr. William J. Bryan, and demanded his renomination in 1900; declared radical and unalterable opposition to American "imperialism"; denounced what it alleged to be a secret alliance between Great Britain and the Republican administration; demanded that the Cubans and the Filipinos be not only permitted, but encouraged, to establish independent republics; declared a large standing army in our republic a menace to liberty; favored the initiative and referendum, the passage of the eight-hour labor law, the more rigid inspection of mines and workshops, the prohibition of sweatshops, and the abolition of the contract system of prison labor; declared that all unlawful combinations of capital are the legitimate fruits of a gold standard and Republican tariff legislation; and recommended a constitutional amendment providing for the election of President, Vice-President, and United States senators by a direct vote of the people.

The platform of the Non-Partisan party demanded direct legislation; public ownership of public utilities; union wages, hours, and conditions for skilled labor, and an eight-hour day with living wages for unskilled labor on all public works. It was also frankly opposed to the administration's Philippine policy.

Election.—The Ohio election was considered the most important of the year. While national issues were principally under discussion, personal and local party controversies had something to do with the results. The Republican candidate, George K. Nash, received 417,199 votes; John R. McLean (Dem.), 368,176; Samuel M. Jones (Non-Part.), 106,721; Seth H. Ellis (Union Ref.), 7799; G. M. Hammell (Pro.), 5825, and R. Bandlow (Soc. Lab.), 2439. Mr. Nash was elected by a plurality of 49,023, and the total vote cast was 908,159. The result was regarded by the Republicans as an emphatic endorsement of Republican policy, by the Democrats as a repudiation of Senator Hanna at home, and by the Non-Partisans as a justification of their cause, and as meaning the beginning of the end of government by parties and party bosses, and the inauguration of real government by the people.

State Officers and National Representatives.—Governor, George K. Nash; lieutenant-governor, John A. Caldwell; secretary of state, Charles Kinney; auditor, W. D. Guilbert; treasurer, Isaac B. Cameron; attorney-general, John M. Sheats; commissioner of common schools, Lewis D. Bonebrake; adjutant-general, H. A. Kingsley; secretary State Board of Agriculture, W. W. Miller. Supreme Court: Chief justice, John A. Shauk; associate justices, T. A. Minshall, William Z. Davis, Marshall J. Williams, Jacob F. Burket, William T. Spear; clerk, Josiah B. Allen. The State legislature consists of 73 Republicans, 1 Independent Republican, and 67 Democrats. Senators: Joseph B. Foraker, from Cincinnati, and Marcus A. Hanna, from Cleveland—both Republicans. Representatives: W. B. Shattuc (Rep.), from Cincinnati; J. H. Bromwell (Rep.), from Cincinnati; J. L. Brenner (Dem.), from Dayton; R. B. Gordon (Dem.), from St. Marys; David Meekison (Dem.), from Napoleon; S. W. Brown (Rep.), from Lebanon; W. L. Weaver (Rep.), from Springfield; Archibald Lybrand (Rep.), from Delaware; J. H. Southard (Rep.), from Toledo; S. R. Morgan (Rep.), from Oak Hill; C. H. Grosvenor (Rep.), from Athens; J. J. Lentz (Dem.), from Columbus; J. A. Norton (Dem.), from Tiffin; W. S. Kerr (Rep.), from Mansfield; H. C. Van Voorhis (Rep.), from Zanesville; J. J. Gill (Rep.), from Steubenville; J. A. McDowell (Dem.), from Millersburg; R. W. Tayler (Rep.), from Lisbon; Charles Dick (Rep.), from Akron; F. O. Phillips (Rep.), from Medina; T. E. Burton (Rep.), from Cleveland.

OHIO STATE ARCHEOLOGICAL AND HISTORICAL SOCIETY. See ANTHROPOLOGY IN AMERICA.

OIL PAINTERS, SOCIETY OF, a British society of artists, until 1898 called the Institute of Painters in Oil Colors, was founded in 1883. It holds annual exhibitions in November. President, Frank Walton; secretary, W. T. Blackmore. Headquarters, Piccadilly W., London, England.

OKLAHOMA, a southern Territory of the United States, has an area of 39,030 square miles. The capital is Guthrie. The Territory was organized in 1890.

Mineralogy.—The mineral resources, which are known to be numerous and of great promise for the future, are still either in a state of slow development or awaiting necessary capital. At the present time the extensive stone, cement, and salt de-

posits offer the chief inducements for immediate development. Several rich deposits of copper have been located recently on Carisco Creek, near Kenton, and at one place from 200 to 500 pounds of ore, assaying from \$75 to \$250 per ton, were taken out daily in 1899. Lead and zinc have been found in the Kiowa and Comanche Reservations, where excellent coal also exists, and salt is now being taken at a half-dozen primitive plants along Salt Creek. Oil and natural gas are believed to be abundant, as Oklahoma lies in a direct line between the oil fields of Kansas and Texas, and many paying wells have been drilled in the creek country just east of the Territory. Oil wells have been opened already near Pawhuska, in the Osage Reservation, and at Guthrie, and there are indications of much asphaltum in the known oil regions. At present the most productive industry is quarrying, which yields large quantities of fine stone for building and road-making purposes.

Agriculture.—The leading crop which the Territory markets is wheat, of which the production in 1899 was approximately 20,000,000 bushels. Kay County is the leading wheat county, the crop there reaching 3,500,000 bushels. A single field of 5000 acres yielded 90,000 bushels. The corn crop was estimated as at least 75,000,000 bushels. At the Omaha Exposition in 1898, Oklahoma produced the tallest stalk of corn, measuring over 19 feet. The cotton crop, which averages from one-half to three-fourths of a commercial bale per acre, was about 140,000 bales, worth in the market about \$5,000,000. Cotton is the chief ready-money crop of the Territory. Kaffir corn, a native of Africa, has become one of the valuable crops of Oklahoma, yielding from 40 to 80 bushels of thrashed seed per acre, and being able to withstand the hottest season. Oats, a comparatively new crop here, yield an average of about 60 bushels per acre, with a known maximum of nearly 100. Castor beans, bringing in the market from 85 cents to \$1 per bushel, yield about 125,000 bushels per annum, and peanuts, comparing favorably with those of Virginia, North Carolina, and California, yield from 50 to 100 bushels per acre, and bring 60 cents per bushel. Over 1000 acres were planted with this crop in 1899. There are now 79 grain elevators in the Territory, with an aggregate capacity of 1,341,000 bushels. Horticultural interests are represented by more than 20,000,000 fruit trees, and during 1899 over 12,000,000 jars were used in fruit-preserving for domestic use. Peaches, apples, and grapes are especially prolific. The live stock assessed in 1899 comprised 216,971 horses, 44,191 mules, 849,767 cattle, 36,652 sheep and 228,498 swine.

Manufactures.—The Territory had 35 flour-mills, with a combined capacity of 5100 barrels per day, in 1899; fully 200 cotton gins; cotton-seed oil mills in six cities; more than a dozen cotton compresses; foundries and planing mills in four cities; creameries in six cities and towns; canning factories in three; cheese factories at Perkins and Orlando; machine shops at Shawnee; carriage and wagon factories at Oklahoma City and Guthrie; more than a dozen cigar factories; several wineries; and brick-making plants in nearly every city and important town. Ten cities and towns have modern ice and cold-storage plants.

Education.—At the close of the fiscal year 1897-98, there was a school population of 101,474; public school enrolment, 77,121; and average daily attendance, 49,182. There were 1929 organized school districts; 1962 public schools, 2107 teachers, and public school property valued at \$600,000. The revenue was \$570,238; expenditure, \$415,347, of which \$291,052 was for teachers' salaries. There were 2 public high schools, with 7 teachers and 246 students; 2 private secondary schools, with 9 teachers, 45 secondary students, and 91 elementary pupils; a public normal school at Educond, with 9 teachers and 251 students in all departments; a Territorial university, with 10 professors and instructors, 367 students, 2300 volumes in the library; \$6000 invested in scientific apparatus and \$60,000 in grounds and buildings, and \$21,100 in total income; an agricultural and mechanical college, with an efficient experiment station; and Langston University for colored students. The oldest sectarian school is the Sacred Heart College, founded in 1876 for the education and conversion of Indians, and now devoted wholly to white pupils. The Roman Catholic Church has also a college for girls at Guthrie; the Congregational, one at Kingfisher; the Baptist is building one, and the Methodist, Episcopal, Congregational, and Presbyterian have mission schools among the Indians in the southwest. The Northwestern Normal School, at Alva, was completed in 1899. In that year there were 106 periodicals, of which 9 were dailies, 87 weeklies, and 9 monthlies.

Churches.—In 1899 there were over 630 churches, chapels, and mission houses, valued at more than \$400,000, with an aggregate membership of over 47,000; 850 Sunday schools, with 6000 officers and teachers, and 40,000 scholars, and 156 Young People's Societies of Christian Endeavor, with 7300 members.

Banks.—On October 31, 1899, there were 9 national banks in operation and 3 in liquidation. The active capital was \$425,000; circulation, \$104,720; deposits, \$1,414,344; reserve, \$575,642; and resources, \$2,116,021. The Territorial banks numbered 68, and had capital, \$604,600; deposits, \$3,022,373; resources, \$3,930,720; and surplus and profits, \$286,952. There were also four building and loan associations.

Insurance.—In 1899 there were 39 fire, 19 life, and 6 accident and casualty companies licensed to do business in the Territory. The local business of outside fire companies in 1898 was, insurance written, \$8,839,556; premiums received, \$167,680; losses incurred, \$24,637; life companies (incomplete), amount of policies issued, \$1,738,306; premiums received, \$76,515; losses incurred, \$55,842; other companies, outstanding risks, \$47,888; premiums received, \$72,698; losses incurred, \$1000. The last legislature authorized the organization of mutual companies of farmers to insure grain, live stock and farm buildings.

Railways.—The new railway construction in 1898 was 120.10 miles, and in 1899 156.29 miles, giving the Territory a total mileage of 761.26, according to the reports adopted in this volume. Local authorities claimed a total, in March, 1899, of 920.65 miles, of which 686.13 was main track. Railway property was valued for taxation at an aggregate of \$3,338,344.

Finances.—The total bonded debt, March 1, 1899, was \$48,000; outstanding warrants, \$250,000—total indebtedness, \$298,000. The assessed valuations for 1898 were \$40,623,816, and for 1899, \$42,082,414; tax rate for all purposes, 5.2 mills.

Population.—There was no enumeration in 1899, but Governor Barnes estimated the population at 375,000; Indian population, 12,041.

Legislation.—The Australian ballot law, with the "blanket" provision for voting, was passed. A department of geology and natural history was established. Two new officers were appointed, a bank commissioner and a chief grain inspector, the latter with supervision of all warehouses, elevators and granaries. A law was also passed regulating the organization and business of banking, and the duties and liabilities of officers and stockholders. School districts must levy a tax for public libraries. Notes and mortgages given by members of building and loan associations are exempt from taxation. Associations of not less than one thousand farmers may be formed for mutual insurance against loss by fire, hail, lightning, and cyclones.

Territorial Officers and National Delegate.—Governor, Cassius M. Barnes; secretary, William M. Jenkins; treasurer, F. M. Thompson; attorney-general, H. S. Cunningham; superintendent of education and auditor, S. N. Hopkins. Supreme Court: Chief justice, J. H. Burford; associate justices, C. E. Irwin, B. F. Burwell, B. T. Hainer, John L. McAtee; clerk, B. F. Hegler. The Territorial legislature consists of 25 Republicans, 5 Democrats, 6 Fusionists, and 3 Populists. National delegate, Dennis T. Flynn (Rep.) from Guthrie.

OLD-AGE PENSION MOVEMENT. The granting of pensions to persons incapacitated for labor by old age is based upon the principle that in the manual callings the physical strength and agility of youth are the chief qualities requisite in the workingmen, and that, attaining their maximum soon after the age of twenty, they tend to decline rapidly at an age when in other occupations, such as that of the lawyer, physician, or the merchant, the knowledge gained by experience more than offsets the loss of physical energy. Such an offset is not present to like degree in manual callings, since from their very nature skill and intelligence play a relatively less important part in them. In the 1898 YEAR BOOK an account was given of the old-age pension legislation in New Zealand, including an explanation of the objects of this legislation, together with some criticisms which were made upon it at the time. It is still too early to test the efficiency of this measure by the results. During the year 1899 the most important seat of the old-age pension movement was England. Three valuable reports bearing upon the subject were published in that year—namely, the report of the Select Committee on the Aged Deserving Poor; the report of the Select Committee on the Cottage Homes Bill, and the report given by the Labor Department of the Board of Trade on Provision for Old Age by Government Action in Certain European Countries. The subject-matter of this article will therefore relate especially to England, but it may be of interest to give by way of introduction a brief outline of the attitude of other European governments toward this subject.

Old-Age Pension Systems.—Of the leading European countries Germany and Denmark alone have adopted a general system of pensions or relief in old age. The German system dates from 1889. It involves a compulsory insurance against old age or invalidism, and in 1897 it was estimated that over 400,000 persons drew pensions, amounting to \$13,831,000, of which over \$4,866,000 was derived from the state and the rest, in equal parts, from deductions from wages and from payments by employers. The average pension is about \$34 a year. This was the result of Bismarck's famous venture in imperial socialism. It has not been wholly satisfactory even to those who have benefited from it, nor has it fulfilled the hopes of its founder by checking the spread of socialism. In Denmark the system consists in a grant of old-age relief to needy persons of good character, but the amounts given are not large, and are bestowed as a supplementary income to persons who are already in receipt of some means, with a view to bringing up the total income to the point at which subsistence is possible. It closely corresponds to the out-relief granted in England to the deserving poor, except that it may be applied for as a matter of right, and brings no

civil disqualification. A system of compulsory insurance modelled on that of Germany was recommended by a royal commission in Holland in 1895, but it was not established by legislation. Sweden also has shown a tendency to follow the German example. In France there is a compulsory provision for old age in the case of seamen and miners, but in general all that the French have done is to place a sort of bonus upon savings, whereby persons 70 years old and over, who have paid contributions to the *Caisse nationale des retraites pour la vieillesse*, or subscribed to an approved friendly society, may secure from the state an addition to their pensions, but the whole pension together with this addition must not amount to more than £14 8s. a year. Belgium has a system somewhat similar to that of France, and in Italy a national pension fund for old-age contributions is aided by the state.

The English Movement.—Public attention was drawn to the necessity of providing a better system of old-age relief by certain reports which were made to Parliament in 1890 and 1891. From these reports it appeared that the relative increase of pauperism after the age of 60 years was remarkably rapid. On the basis of the figures given it was said that about 20 per cent. of the population over 65 years of age was in receipt of poor relief in one day, and about 30 per cent. in the course of one year. These conclusions led to the appointment of a royal commission in 1893 for the purpose of considering whether any alterations in the system of poor relief were desirable in the case of persons whose destitution was occasioned by incapacity for work resulting from old age, or whether assistance could otherwise be offered in those cases. After a session of two years and a careful study of the administration of the poor law the commission presented its report. In the first place, as to the ratio of total pauperism to the total population it was found to have declined greatly since the middle of the century, and this decline was attributed in part to the increase in the national wealth and in part to the disappearance of the able-bodied pauper as a result of a better poor-law system. In the second place, it showed that the recipients of relief were mainly aged and infirm; that the out-relief given to all the aged poor of fairly respectable character who are in need of relief amounts on the average to about half a crown a week; and that this relief is given on the assumption that its recipients have already some means of their own. It was further pointed out that this relief was granted with too little discrimination by the Board of Guardians; that the applicants for relief are not carefully watched, and that it often happens that too little or too much is granted. The commission's investigation of the condition of the workhouses showed that in their provision for material comfort they had greatly improved in recent years, and that it was this improvement mainly which had increased the expenditure under the poor law in England and Wales. Besides investigating the poor-law system the commission studied the various methods of granting old-age relief as through the endowed charities, friendly societies, etc., and also examined several old-age pension schemes. But when it came to recommending remedies the report was somewhat indefinite. The majority could not agree upon any old-age pension scheme, and the commission contented itself with recommending greater care on the part of the Board of Guardians in dealing with applicants for relief. The old-age pension schemes, however, were thought to be deserving of a more careful examination, and a new committee, known as the Rothschild Committee, was appointed by the government in 1895. It was to consider schemes for encouraging the industrial population, by state aid or otherwise, to make provision for old age, and to pay especial attention to the social, financial, and economic results of such schemes. The report of the committee was published in 1898. For one reason or another it condemned schemes for old-age endowment by means of deferred state-aided annuities. As to a pension system, it declared that it could not advise the government to establish one, since such a course would be difficult and expensive, and would not reach the really destitute. It rather weakly suggested a scheme of supplementing from the public funds incomes of persons 65 years of age, provided these persons could produce an income from an assured source of not less than 2s. 5d., or more than 5s. a week. The supplementary income from the public funds was to vary inversely with their own incomes, but was not to exceed 2s. 6d. a week. After making this suggestion the committee pointed out the dangers of counting upon it, showing that after a certain point was reached it might even tend to discourage thrift.

The Situation in 1899.—In 1899 the report of the Select Committee on the Cottage Homes Bill was published, and in so far as it related to the condition of the workhouses it confirmed the report of the earlier Royal Commission. Its chief recommendation was that there should be a better classification of the inmates of these houses; that the children should be kept outside; that pauper imbeciles and epileptics should be kept in separate institutions, and that cottage homes should be provided by the guardians for certain married couples and respectable old persons whose inability to provide for themselves was due to misfortune. Another and more important report published in this year was that of the Select Committee of the House of Commons on the Aged and Deserving Poor, which had been appointed to report

upon the best means of improving the condition of the aged deserving poor and providing for such of them as are helpless, and to make an especial examination of old-age pension schemes. The views of the members of this committee were divided. One set of opinions was represented by Mr. Lecky, who held that any such pension scheme was a dangerous and retrograde step likely to bring back the evils of the old poor-law system. It would tend, he said, to lessen the efficiency of voluntary organizations, weaken the habits of providence and thrift, and lead to the increase of pauperism. From this point of view the only thing to be done was by way of gradual improvement on the basis of the present poor-law system. This was not the attitude of the majority of the members, and the report embodying this principle was rejected. A view which met with some favor was that all persons having certain specified qualifications should be legally entitled to old-age pensions. The qualification commonly proposed was that the applicant must be a member of a friendly society for a specified length of time. The objection to this was that, in the first place, the fact of membership in a friendly society does not of itself prove that a person is entitled to a pension, nor is the absence of this qualification necessarily a sign of unfitness. It was urged that in Ireland membership in friendly societies was not common even among the thrifty, and again that such a qualification would bear hard upon women, since many of them, no matter how thrifty they were, could not find the means to pay the regular dues, and, since these friendly societies had for the most part something of the character of men's clubs, it furthermore seemed most unfair that a widow with children to support should be disqualified, while a prosperous artisan, able to lay by a little out of his earnings, should be entitled to a pension. Nor was there anything morally convincing in a rule that would exclude a man merely because he had preferred to place his earnings in a savings bank instead of the exchequer of a friendly society. A third and more radical view was that every person over 65 years of age who had not received poor relief under the poor law save under exceptional circumstances during the past twenty years, and who had never been convicted of a criminal offence, should be legally entitled to a pension provided his own income did not exceed 10s. a week. A scheme of this sort would have a very sweeping character, since the number of persons in the United Kingdom over 65 years of age is about 2,000,000, and of these it has been said that only about 700,000 have an income of more than 10s. a week. The clause excluding those who had received poor-law relief would of course reduce the number of persons entitled under the new system, but this exclusion would cease to operate after the present generation of paupers had died out. In the meanwhile all others would do their best to keep off the rates, and in this they would be aided by private charities. The result would be, it was feared, that the ranks of the pensioners would be recruited from above and below, and the burden upon the public purse would be enormous. Thus on the one hand was presented a plan that seemed unfairly exclusive, and on the other a plan that would impose an incalculable financial burden. The committee finally reached a compromise in their efforts to escape the vicious dilemma involved in these two schemes—that is, the danger which is at the root of all charitable endeavor, that in helping one class another class may be discouraged from helping itself. The compromise consisted in giving the right to pensions to any person over 65 years of age who had not received poor relief, or been convicted of a crime or possessed an income of more than 10s. a week, provided that such person has endeavored to the best of his ability to provide for himself. To prove that he had endeavored to the best of his ability to provide for himself, the applicant must show that either through membership in a benefit society or through some other medium he had tried to lay by a portion of his income for his future support. This again is a very elastic system, since the administrators of the law would be likely to interpret in different ways the nature of these qualifications. It was therefore impossible to ascertain beforehand what the expense entailed by this system would be. On this point the committee advised that the matter should be left in charge of competent experts. Another feature of the plan was the division of the country into pension districts corresponding with the unions. Within each district the scale of pensions was to be fixed at a sum not less than 5s. or more than 7s. a week. An additional point in which the scheme laid itself open to criticism on the score of undue elasticity was the provision that the pensioner should not have received poor-law relief, save in wholly exceptional circumstances. It was very doubtful what construction would be placed upon the term exceptional circumstances. Among the questions likely to arise there would be, for instance, the case of the person who had voluntarily reduced his income to a point just below 10s. a week in order to get the benefit of the pension. Such a course would obviously be to the advantage both of him and of his employer. But the critical point in the committee's plan is the proposition that the right to a pension shall be legally enforceable. Under the old poor-law system applicants for out-relief had a legally enforceable claim. The result was disastrous, and the reform of 1834 took away this legal title, so that under the present law no one has a legal right to more than the shelter of the workhouse.

The authority of the guardians in the matter of out-relief to the old and infirm is facultative merely. But as a matter of fact they have bestowed it in the great majority of cases. The present reform has for its object the substitution of fixed and adequate pensions for varying and inadequate doles of out-relief, and also the inclusion of a class of people just barely able to support themselves, and therefore ineligible for relief under the present system. The experience of England before the poor-law reform has led many to deplore the restoration of a legal right to relief. Those who take this view, while sympathizing with the objects of the reformers, think that they can best be gained by developing the existing poor law. They think that the aged poor should receive permanent, adequate, and discriminating relief, but that this result can be obtained without establishing the principle of a legally enforceable right. They urge, too, that if such right were once granted, it could not well be revoked, and that the safer course would be to see first how far the ends could be attained without the admission of this new principle. The difficulties involved in any system of old-age pensions which shall prescribe the classes entitled to relief are so great as to lead some to dismiss them all as impracticable. Mr. Charles Booth, for instance, goes so far as to say that the only principle upon which a good working scheme can be based is that of giving pensions without regard either to need or to desert, his maxim being that they should be given to all the old or to none at all. A writer in the *Edinburgh Review*, whose comments upon the recent pension schemes have been in part summarized in the above criticisms, sums up the present situation in the United Kingdom in the following paragraph:

"This, then, is the position which the government have to face. A royal commission, after examining the subject for two years, reported strongly against the adoption of any general scheme of old-age pensions. An expert committee, after another two years' meditation, found it impossible to recommend any scheme involving definite voluntary contributions by the pensioners. At the same time they clearly intimated their concurrence with the view held by the Royal Commission that a more general scheme would be injurious to the economic health of the community. A select committee of the House of Commons, chiefly composed of men already deeply pledged to some large change, has recommended a scheme of which the cost, depending as it does upon contingencies, cannot be estimated with any approach to exactness, but certainly will, in the near future, be very large. Even at first it will probably be so great as to make necessary a development of our financial system. Either there must be an increase of death duties and income tax or, as Mr. Chaplin and others have already proposed, a return to discarded customs duties, such as taxation of imported foodstuff. The results of any large step taken by the Cabinet will be as far-reaching in the way of finance as in that of industrial economy. It is possible that, as in that fatal year of poor-law reform—1796—we may be on the verge of doing much harm in order to do some good. The remedy may be more desperate than the disease. We think, indeed, that the hardship of the existing system to the poor has been somewhat exaggerated in the preliminary part of the Select Committee's report. There are, no doubt, a multitude of hard cases both below and just above the line of actual pauperism, but these may, perhaps, be met by a reform less full of risk to the social health of the nation. If the evil can only be met by a very large measure there is much to be said in favor of the adoption of that proposed by the select committee. But if the government think it best not to embark at once upon a scheme so large, and possibly so full of latent dangerous consequences, they will, as cautious trustees of permanent national interests, have good reasons for their decision. They may well prefer to submit to Parliament, at least as an interim experiment, some less ambitious measure, remembering that one can proceed if necessary from the smaller to the larger, but not conversely."

ONTARIO, a province of the Dominion of Canada, with an area of 222,000 square miles, exclusive of the parts of the great lakes of the St. Lawrence within the limits of Canada. Capital, Toronto.

Mineralogy.—Ontario is the only province in the Dominion that has legislated for the promotion of the iron industry. The production of pig-iron from all ores was 25,270 long tons in 1896, 23,854 tons in 1897, and 43,083 tons in 1898. The product of the last year was valued by selling price at \$530,789. During 1899 the output of pig-iron was largely increased by the establishment of the Deseronto smelter, but the exact amount was not available at the end of the year. Gold-mining showed an encouraging advance, the production of bullion being 3038 ounces in 1895, 7154 in 1896, 11,412 in 1897, and 16,075, valued at \$271,906, in 1898. Nickel-mining was the most extensively developed industry. Nickel and copper mines together employed an average of 610 men, and wages ranged from \$240,151 in 1896 to \$315,500 in 1898. The output of refined copper was 8,363,560 pounds, of which 4,571,000 pounds were exported; and the production of fine nickel was 5,517,600 pounds, valued at \$1,820,838. Almost the entire nickel product is exported to the United States for use in naval

construction. For regulations concerning the nickel industry see CANADA (paragraph Mineral Products).

Fisheries.—The value of all fishery catch in the calendar year 1897 (the last officially reported) was \$1,289,822, a decrease in a year of \$315,852, and the lowest value since 1884. The principal catch was trout, \$454,538; whitefish, \$228,664; and herring, \$157,349. Exports of all fisheries in 1898 amounted to \$381,045; the distribution of fry was 78,345,000; and the capital investment in all fisheries, \$744,431.

Agriculture.—In the calendar year 1898 the yield of winter wheat was 25,158,713 bushels; spring wheat, 6,873,785; oats, 86,858,293; barley, 12,663,668; turnips, 64,727,882; potatoes, 14,358,625; mangel wurzels, 21,957,564; corn for husking, 23,442,593; clover and hay, 4,399,063 tons; and tobacco, 10,560,590 pounds. The estimated value of all farm lands in 1897 was \$554,054,552; buildings, \$206,090,159; implements, \$51,299,098; and live stock, \$93,649,804—total, \$905,093,613.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise aggregated in value \$51,651,597, nearly all of which was entered for home consumption; exports, domestic and foreign, \$46,786,295, an increase in a year of \$7,473,069; duty collected, \$8,189,407. Navigation was facilitated by 189 light stations, 245 lighthouses, 3 light-ships, and 18 fog alarms. The registered merchant marine of the province comprised 924 steamers of 99,419 gross tonnage and 528 sailing vessels of 34,761 tonnage.

Banks.—On January 1, 1899, there were 306 chartered banks and branch banks in the province, and during 1898 the exchanges at the clearing house in Toronto amounted to \$439,489,336, an increase in a year of \$77,732,383, and in Hamilton, to \$35,637,964, an increase of \$2,287,422. There were also 478 post-office savings banks, with 95,663 depositors and \$21,585,079 deposits, and 1 government savings bank, with 1465 depositors and \$633,151 deposits.

Railways and Telegraphs.—On June 30, 1898, the total length of railways in operation was 6674 miles, the largest provincial mileage in the Dominion, and the total grants to roads constructed and under construction then amounted to \$20,002,773. Government telegraphs, comprising the Pelee Island system, had a total length of 24 miles of land lines and 10 miles of cables, with 10 offices, and revenue, \$1830; expenditure, \$1062.

Post-Offices.—At the end of 1898 there were 3213 post-offices in the province, in which were posted during the year 69,250,000 letters and 18,250,000 postal-cards; and 803 money-order offices, which issued 627,498 orders.

Education.—Reports for the school year 1897 showed school population 590,055; pupils registered in public schools, 482,777; average daily attendance, 273,544; schools open, 6009; teachers, 9128; receipts, \$4,988,155; expenditures, \$4,215,670. Roman Catholic separate schools numbered 340, and had 41,620 pupils, \$335,324 receipts, and \$302,169 expenditures. There were also 130 high schools, with 24,390 pupils, 579 teachers, \$767,487 receipts, and \$715,976 expenditures; 60 county model schools, 105 kindergartens, 73 teachers' institutes, 18 night schools, and 7 art schools, with about 500 students. The Department of Education also had under its control 244 public libraries, with over 418,000 volumes, and there were 103 other free libraries, with more than 371,500 volumes. At the end of 1899 there were 516 periodicals, of which 54 were dailies and 372 weeklies.

Finances.—The revenue of the province in the year ending December 31, 1898, was \$3,647,353; expenditure, \$3,802,591; liabilities payable in the next 30 years, \$2,066,642; excess of assets over liabilities presently payable, \$4,988,079.

Population.—Local estimates in 1898-99 gave Toronto, 186,517; Ottawa, 55,386; Hamilton, 50,035; London, 38,575; Kingston, 18,001; Brantford, 16,234; Windsor, 11,394; Guelph, 10,741; Stratford, 10,369; St. Catharines, 10,144; Belleville, 10,113; Woodstock, 9110; Chatham, 8923; Brockville, 8841; Owen Sound, 8120; Galt, 7501; Lindsay, 7142; Cornwall, 6334; Collingwood, 5514; Barrie, 5506; Pembroke, 5025. The Indian population of the province in 1898 was 20,618. There were 77 schools for Indian youth, which had an enrolment of 2670 and average attendance, 1441. The Indians cultivated 68,305 acres of land, had 17,835 head of live stock, and received \$336,466 from their various industries.

ORANGE FREE STATE, a republic of South Africa, is surrounded by four other states—namely, the Transvaal, or South African Republic, on the north; Natal and Basutoland, on the east, and Cape Colony, on the south and west. A large number of Boers came from Cape Colony to Natal in the first half of the century and attempted to set up a government there. Their efforts were made useless by the action of Great Britain in proclaiming that territory a colony in 1843. whereupon the Boers withdrew into the interior and founded the Orange Free State. In 1848 that territory also was proclaimed a British possession, but by a convention of 1854 its independence was acknowledged by Great Britain. In 1899 the state became involved in the Anglo-Boer war by reason of a defensive alliance between the two Boer republics. It has an estimated area of 48,326 square miles

and an estimated population of 207,503, including 129,787 natives and 77,716 whites. Eighty-five per cent. of the latter are Boers. The capital and largest town is Bloemfontein, with a population of about 4000. Pastoral lands make up the greater part of the country, and are well adapted to grazing. The chief occupation is the raising of live stock, especially sheep. Diamonds and coal are the principal minerals; gold and garnets and other precious stones are also found. Foreign trade passes principally through the ports of Natal and Cape Colony. The chief items of export are diamonds, wool, hides, grain, and ostrich feathers. In 1898 these exports were valued at £1,923,425 and the imports at £1,190,932. The chief destination of Orange Free State exports is the Transvaal. The revenue, which is derived principally from import duties, together with stamps, posts and telegraphs, transfer dues, and the native poll-tax, was in 1898, £799,757. The expenditure was £956,752, mainly for public service and works, education, posts and telegraphs, and artillery. The public debt, incurred mainly for railway purposes, was in 1898 about £1,830,000. The railroad mileage is 366, and is under state control. Defence is provided for by establishing liability for military service for all males from 16 to 60 years of age. At the capital are 4 batteries of artillery, with a reserve. It is estimated that in the fall of 1899 a force of about 20,000 burghers re-enforced the Transvaal army in the Anglo-Boer war, which broke out in 1899. The government is republican, and consists of a president (M. T. Steyn [*q. v.*] in 1899), chosen for five years, and of a legislative council, or *Volksraad*, chosen by the vote of the adult white males for four years, suffrage being restricted by a property qualification. The majority of citizens are members of the Dutch Reformed Church. Education is supported by the state, but is not compulsory or free.

Events in 1899.—The causes which led up to the rupture between the Transvaal Boers and the British in South Africa are fully treated in the article TRANSVAAL. It is necessary only to point out that the antagonism toward the British and British rule was largely shared by the Boers both of the Transvaal and of the Orange Free State, but the latter republic admitted the Outlanders, or non-Boer whites, to participation in the government, while that privilege was in large measure denied to the Outlanders resident in the Transvaal. From the first it was evident that the Orange Free State government was in sympathy with the position taken by the Transvaal, and during the earlier negotiations held by the latter republic with the British there was present at Pretoria in an advisory capacity, it is said, a member of the Free State executive. The Free State government endeavored to act as a mediator between the conflicting states, but at a meeting held at Bloemfontein in May, by invitation of President Steyn, between President Kruger and Sir Alfred Milner, British high commissioner of South Africa, no agreement was reached. Sir Alfred at a later date notified President Steyn that the massing of British troops on the Free State borders was a movement in no way directed against that republic, and that if the strict neutrality of the latter were maintained, there would be no reason to fear for the integrity of the Free State institutions. In reply President Steyn made it plain that the republic regarded unfavorably the presence of British troops, both on its own and on the Transvaal borders, and practically said that he could not be responsible if the burghers should become aroused over the matter. Upon the presentation of the ultimatum from the Transvaal (October 10) President Steyn made a formal statement of his intention to join forces against the British, and the Free State troops made, in fact, the first move of the war by the seizure of a train over the Natal frontier, which was followed up by the moving of a large body of troops into Natal to co-operate with the forces from the Transvaal, and on the west into upper Cape Colony, about Kimberley. Various proclamations were issued annexing to the Free State the colony of Natal above the Tugela River and parts of Cape Colony, and efforts were made to induce the colony Dutch to join the forces of invasion. Besides TRANSVAAL, see CAPE COLONY and NATAL.

ORATORIO SOCIETY, founded in 1873 by Dr. Leopold Damrosch, holds concerts in Carnegie Hall, New York City, and had 279 members in 1899. Secretary, William B. Tuthill, 287 Fourth Avenue, New York City.

ORE DEPOSITS. Turner shows that some of the metalliferous vein deposits may have been formed by replacement, even where the vein is composed entirely of quartz, and that the fissure was not filled by the deposition of the quartz from solution. The two kinds of quartz may be distinguished by their structure when observed with polarized light. Weeds points out that mineral veins may be enriched by a later deposition of metallic sulphides by descending waters, and that in many quartz and jasper veins of Montana the gold and silver ores have been deposited by hot springs. Vogt, in the *Zeitschrift für Praktische Geologie*, contributes a valuable series of articles on the relative distribution of the metallic elements and their concentration into the form of ore bodies. Gürich proposes a new classification of ore deposits, based on their origin.

OREGON, a Pacific coast State of the United States, has an area of 96,030 square miles. The capital is Salem. Oregon was admitted to the Union, February 14, 1859.

Mineralogy.—The production of the precious metals in the calendar year 1898 was: Gold, 56,966 fine ounces, valued at \$1,177,600, and silver, 130,000 fine ounces, coining value, \$168,081—total value, \$1,345,681. The official estimate for 1899 was: Gold, \$1,550,387 and silver, \$193,940—total value, \$1,744,327, indicating an increase of \$398,646. Coal, with an output of 58,184 short tons, valued at \$212,184 in 1898, showed a decrease in a year of 52,105 tons, caused by the closing down of the Beaver Hill mine. Quarrying yielded sandstone to the value of \$7864, and limestone, \$7480. This industry shows considerable fluctuation each year. No granite worth reporting was quarried in 1898.

Public Lands.—On June 30, 1899, the amount of public lands reserved was 5,500,821 acres; area appropriated, 3,697,962 acres; area unreserved and unappropriated, 35,328,338 acres, of which 24,145,544 acres were surveyed and 11,182,794 acres unsurveyed. The surveyor-general reported that the general contour of lands, particularly in the eastern and southern portions of the State, is such as to favor irrigation, which would convert into fertile farms the large semi-arid tracts which have hitherto been considered practically worthless; but in the last few years large irrigation companies have been formed, and water has been conducted for miles over unsurveyed and unoccupied lands, which in a few years will be settled.

Salmon Industry.—In the early part of the season of 1899 it seemed evident that the salmon catch on the Columbia River would fall far below the average; but at the end of the season, August 10, it was believed that the full returns would show about the usual results. The rapid growth of the cold-storage business has made a material difference in the relative proportions of the salmon catch and salmon pack. For this reason an apparent shortage of from 50,000 to 100,000 cases in the packs does not necessarily mean that salmon are becoming scarcer. It is held by experienced operators that with artificial propagation and well-enforced laws regarding close seasons and the methods of taking fish there is no apparent reason why the catch should not be maintained at its best proportions, and perhaps increased, even though the pack should show a decline.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise in the districts of Oregon and Willamette aggregated in value \$1,522,097; exports, \$9,116,973, a decrease in a year of \$10,745 in imports and \$5,144,855 in exports. Much of this decline in foreign trade is due to the shipment of local merchandise by rail and water to the ports of Washington and California, which receive credit that properly belongs to Oregon.

Railways.—The new railway construction in the calendar year 1898 was 62.25 miles, and in 1899, 22.90 miles, giving the State a total mileage of 1638.78.

Education.—The school census of 1898 gave a total enumeration of 130,750. At the close of the school year 1897-98 the enrolment in the public schools was 85,230; average daily attendance, 62,799. There were 3693 teachers, 2013 buildings used as school-houses, and public school property valued at \$3,748,154. The revenue was \$1,238,168; expenditure, \$1,274,937, of which \$795,052 was for teachers' salaries. There were 13 public high schools, with 47 secondary teachers, 1594 secondary students, and 85 elementary pupils; 19 private secondary schools, with 87 teachers. 861 secondary students, and 1565 elementary pupils; and 3 public normal schools, with 26 teachers and 894 students in all departments. Normal training was also given in 3 colleges and 1 public high school. Eight universities and colleges for men and for both sexes reported 27 scholarships, 155 professors and instructors, 1317 students, 27,413 volumes in the libraries, valued at \$59,415; \$23,650 invested in scientific apparatus, \$832,000 in grounds and buildings, and \$342,000 in productive funds; \$78,732 in total income and \$11,600 in benefactions. In 1899 there were 204 periodicals, of which 19 were dailies, 148 weeklies, and 25 monthlies.

Banks.—On October 31, 1899, there were 28 national banks in operation and 14 in liquidation. The active capital was \$2,420,000; circulation, \$978,039; deposits, \$6,463,155; reserve, \$2,643,507; and resources, \$19,197,038. State banks numbered 15, and had capital, \$858,467; deposits, \$2,864,564; resources, \$3,864,385; and surplus and profits, \$105,558. During the year ending September 30, 1899, the exchanges at the United States clearing house at Portland aggregated \$87,677,005, a decrease in a year of \$6,895,449.

Finances.—The assessed valuations as equalized for 1899 aggregated \$133,533,571, a decrease in two years of \$1,383,533. The bonded debt is limited to \$1829, of long-past-due bonds, probably destroyed. On January 1, 1899, there were outstanding warrants of various kinds amounting to \$248,910, for which the treasury held excessive assets.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 455,000.

Legislation.—A board of examiners of barbers was appointed, and barbers must

be examined, licensed, and registered; also a State board of dental examiners, and dentists must be examined and licensed. A State biologist and a game and forestry warden are to be appointed, the latter with large executive powers. Police duty shall not be performed by imported armed men, and such bodies shall not be brought into the State, except by the municipality. Crimes may be prosecuted by information, and grand juries may be dispensed with. Interest was reduced from 8 to 6 per cent. The Railroad Commissioner law was repealed, and there is now no such law in Oregon. The entire school system has been remodelled, and a board of text commissioners was created for uniformity of text-books. The State board of equalization of taxation was abolished. The constitutional amendments to be voted upon provide for the initiative and referendum system of enacting laws and for universal suffrage.

State Officers and National Representatives.—Governor, T. T. Geer; secretary of state and auditor, Frank I. Dunbar; treasurer, Charles S. Moore; superintendent of public instruction, J. H. Ackerman; adjutant-general, C. U. Gantenbein; attorney-general, D. R. N. Blackburn. Supreme Court: Chief justice, Charles E. Wolverton; associate justices, Robert S. Bean, Frank A. Moore; clerk, J. J. Murphy. The State legislature consists of 65 Republicans, 9 Democrats, 5 Fusionists, 6 Populists, and 4 Silver Republicans, with 1 vacancy, caused by death. Senators, Joseph Simon, from Portland, and George W. McBride, from St. Helen—both Republicans. Representatives, Thomas H. Tongue, from Hillsboro, and Malcolm A. Moody, from The Dalles—both Republicans.

ORIENTAL SOCIETY, AMERICAN, founded in 1842 for the study of oriental languages, had in 1899 a membership of 360. General meeting for 1900 at Philadelphia in April. The society publishes semiannually the *American Oriental Journal*. President, D. C. Gilman; secretary, Washburn Hopkins, 235 Bishop Street, New Haven, Conn.

ORMISTON, WILLIAM, D.D., LL.D., a well-known clergyman, died at Los Angeles, Cal., March 19, 1899. He was born in Lanarkshire, Scotland, April 23, 1821; was graduated at Victoria College, Cobourg, Ontario, in 1847, in which institution he served for a year as professor of moral philosophy. In 1849 he was ordained in the Scottish United Presbyterian Church. He was made master in the Normal School and later an examiner in the University of Toronto and inspector of the classical schools of the province; he was also an examiner in Knox College and for a time was pastor of a Presbyterian church at Clarke. In 1857 he left this charge to accept the pastorate of the Central Presbyterian Church at Hamilton, Ontario. Having remained here for thirteen years, he accepted a call to the Collegiate Reformed (Dutch) Church in New York, where he was one of the pastors until 1888. In 1890 he engaged in evangelistic work in California. He was a preacher of much force and impressiveness. Dr. Ormiston published various sermons, pamphlets, etc., assisted in the preparation of a series of school books, edited, with notes, *Meyer on the Acts*, and for a number of years prepared the international Sunday-school lessons.

ORNITHOLOGY. There has been little to note in the way of progress in ornithology during 1899 outside of the activities of the various organizations and the publication of an abundance of literature, for, unlike the preceding year, there were no unusually remarkable discoveries.

Organizations.—In spite of the fact that fashion has decreed an outrageous increase in the number of birds and feathers on women's hats, the Audubon societies have continued to grow and increase. In addition to them, the American Society of Bird Restorers has been organized, with headquarters in Boston, and Mr. Fletcher Osgood as general manager. The objects of the society are the protection of our native birds, especially during the nesting season, the appointment of "bird wardens," and the destruction, so far as possible without cruelty, of the English sparrow. A determined effort toward the latter end was made in Boston in the spring with the co-operation of the mayor, but unfortunately so much opposition was aroused that the work had to be given up. It is hoped to organize branches of the society in every town and city. A State organization of ornithologists has been formed in Colorado, and a similar one exists in Maine. These and the older ones, such as the Nuttall, of Cambridge, Mass.; the Cooper, of California, and the Delaware Valley, of Philadelphia, have flourished, and show what a strong hold ornithology has in America as a popular branch of natural history. The American Ornithologists' Union has enjoyed an even more prosperous year than in 1898, but the close was saddened by the death on Christmas day of Dr. Elliott Coues, who was perhaps the most generally known of American ornithologists. As the author of the *Key to North American Birds*; *Birds of the Colorado Valley*, and numerous other works, his name is an unusually familiar one to all bird lovers. The union held its seventeenth annual congress in Philadelphia, November 13-16, and the attendance of

members was larger than ever before. The union now has a membership of 744, of whom 613 are associates. The most important incident of the congress was the donation of \$100 by Miss Juliette A. Owen, of St. Joseph, Mo., an associate member, to be used as the council saw fit. It was voted to make the sum a nucleus of a fund, the income of which shall be used for the advancement of the science of ornithology. The bird protection committee made a very full and interesting report, deploring the increased use of birds and feathers, and showing what had been attempted and accomplished to check the evil. The difficulty lies in securing conviction of dealers, on account of lack of evidence. The hostility of fashion journals, and their publication of erroneous statements, has greatly hindered the work. When such a reputable journal as *Harper's Bazar*, publishes the statement that "égrets" are collected after being shed, and even from "domesticated" birds, so that "the most tender-hearted lady may wear this beautiful ornament with a clear conscience," and then declines to retract or modify it when the absurdity and error are pointed out, it is clear that the protection of birds is a Herculean task so long as fashion demands their use. One afternoon of the public sessions was given up to five papers, illustrated with lantern slides. Mr. Witmer-Stone read Audubon's letters to Baird, and this was one of the features of the congress. Another very interesting part of the programme was the account by Dr. A. K. Fisher of some of the interesting birds met with in Alaska in the summer of 1899, and the notes of the birds were imitated by Mr. L. A. Fuertes. Altogether more than twenty papers were presented, dealing with all phases of ornithology, though it was notable that no less than six of the papers dealt with questions connected with moulting and change of plumage. After the adjournment of the union a party visited Mill Grove, on the Perkiomen, the former home of Audubon.

Literature.—The ornithological literature of 1899 has been abundant, but there is no one work which stands out pre-eminently above the rest. The number of new species of birds described was not large, apparently less than one hundred having been named. The periodical literature has shown a distinct advance. The *Auk*, the official organ of the American Ornithologists' Union, has maintained its position at the head, and has contained numerous papers of popular as well as of technical interest. The first of the year saw the commencement of the new journal *Bird Lore*, under the editorship of Mr. Frank M. Chapman. It is the official organ of the Audubon societies, and contains each month a large amount of unusually high-class reading matter about birds. There are several other monthlies devoted exclusively to birds, most of them being the publication of some one of the ornithological clubs already mentioned. Several popular books on birds have appeared in this country, of very different degrees of merit. One of the best of these for small children is Mrs. Olive Thorne Miller's *The First Book of Birds*. An admirable book and well deserving wide circulation is Mr. D. Lange's *Our Native Birds: How to Protect Them and Attract Them to Our Homes*. It is full of helpful suggestions and sensible advice to all lovers of birds. Newton's *Dictionary of Birds* has been issued in a cheap, unabridged edition in one volume. One of the most readable papers published during the year appears in the *Proceedings of the Royal Physical Society of Edinburgh*, and relates to the habits of the *bower birds*. The paper is by Mr. A. J. Campbell, of Melbourne, and is adorned with excellent illustrations. Mr. Campbell describes the "bowers" of a number of species, from the simplest ones, consisting of a few leaves, up to the "elaborate, orchid-covered hut, with a mossy lawn in front, ornamented with brilliant flowers and berries," of the gardener bird of New Guinea. In the way of systematic works the most noteworthy is Dr. R. B. Sharpe's *Hand List of the Genera and Species of Birds*. This work, of which only the first volume has appeared, is based on the *Catalogue of Birds in the British Museum*. It includes all known birds, both living and fossil, but sub-species are not recognized. Mr. C. B. Cory has published in two volumes *The Birds of Eastern North America*. The books are profusely illustrated and are provided with very simple and useful "keys." A somewhat similar work on British birds has been published. It is called *An Illustrated Manual of British Birds*, and the author is Mr. Howard Saunders. The classification and nomenclature is simple and satisfactory, and the illustrations are good, while three excellent maps add greatly to the value of the book.

ORTON, EDWARD, Ph.D., LL.D., State geologist of Ohio, died October 16, 1899. Born in Deposit, N. Y., March 9, 1829, he was educated at Hamilton College, being graduated with the class of 1848. He devoted himself largely to the study of geology, and in 1869 was appointed State geologist of Ohio; he retained the position to the time of his death. In 1872-73 he was president of Antioch College, and in the latter year accepted a call to the presidency of the Ohio State University and to its chair of geology; from that time until he died he held the professorship, but in 1881 relinquished his position as president. In 1897 Professor Orton was president of the Geological Society of America, and for 1898-99 was president of the American Association for the Advancement of Science. His home was at Columbus, O.

Besides numerous geological papers, he wrote Volumes V., VI., and VII. of the *Geology of Ohio*, and was joint author of Volumes I., II., and III.

OSTREO-TOXISMUS, or oyster poisoning, has received a name and a place in medicine because of its prominence and frequency. It occurs in one of three forms: (1) An acute gastro-enteric catarrh; (2) a specific continued fever, probably due to ptomain poisoning; (3) as true typhoid fever, the oysters having acted as hosts for the typhoid bacillus. In the first variety the symptoms are, a few hours after the stale oysters have been ingested, nausea, vomiting, purging, and loss of appetite. Recovery follows in a few hours. In the second series a fever presents itself a few hours after the oysters are eaten, and lasts a week or ten days, accompanied by profound mental and bodily depression. Convulsions, coma, heart failure, or peritonitis may lead to a fatal issue. True typhoid fever may follow either of these two types.

OTIS, ELWELL STEPHEN, major-general, U.S.V., and brigadier-general, U.S.A., commander of the American forces in the Philippines, was born in Frederick City, Md., March 25, 1838. After his graduation at Rochester (N.Y.) University in 1858 he studied law and was beginning to practise when, in September, 1862, he entered the Union service as a captain in the One Hundred and Fortieth New York Volunteer Infantry, with which regiment he remained to the close of the war. In December, 1863, he became lieutenant-colonel, and in June, 1865, was mustered out. He was brevetted colonel of volunteers for gallantry at Spottsylvania and brigadier-general of volunteers for distinguished services at Chapel Hill. He bore a conspicuous part in the battle of Gettysburg, where his regiment lost 133 men in killed and wounded. In the battle of the Wilderness Lieutenant-Colonel Otis commanded the picket line of the Fifth Corps; in this battle his regiment lost 255 men. Colonel Ryan of the One Hundred and Fortieth was killed at Spottsylvania, and Otis succeeded to the command. The regiment experienced much hard fighting in Virginia between the Rapidan and the James, and through various casualties the command of the regular brigade devolved upon Otis. In an engagement near Petersburg on October 1, 1864, Otis was so severely wounded that he was not able to return to duty. Among the engagements in which he participated were Fredericksburg, Chancellorsville, Rappahannock Station, Spottsylvania, the Wilderness, Gettysburg, the North Anna, Totopotomoy Creek, Bethesda Church, Petersburg, Weldon Road, and Chapel House.

On July 28, 1866, Otis was appointed lieutenant-colonel of the Twenty-second United States Infantry; he became colonel of the Twentieth Infantry in February, 1880; brigadier-general, U.S.A., November 28, 1893; and major-general, U.S.V., May 4, 1898. From 1867 to 1881 he served against the Indians. In the latter year he organized the United States infantry and cavalry school at Leavenworth, Kan. In 1893 he was assigned to the command of the Department of the Columbia, and in 1897 was transferred to the Department of Colorado. In the army General Otis is recognized as a strict disciplinarian and a man of judicial ability, and he has repeatedly been called upon to preside at military tribunals. After his appointment as a major-general of volunteers he was given command of the Department of California, succeeding General William R. Shafter. He was then ordered to the Philippines, and assumed chief command when Major-General Wesley Merritt, U.S.A., sailed from Manila on August 30, 1898, to confer with the peace commissioners at Paris. General Otis was a member of the Philippine commission, the appointment of which was announced by President McKinley on January 17, 1899. The Filipino insurrection began on February 4, 1899, and throughout the year General Otis had command of the American forces. He did not take to the field, but directed the movements of the army from his headquarters in Manila. During the summer and fall of 1899 there appeared in the American press not a little dissatisfaction with General Otis for alleged remissness in pushing forward the war. For an account of the campaigns in the Philippines during the year see the article UNITED STATES. General Otis published in 1878 an authoritative work, entitled *The Indian Question*.

OTIS, HARRISON GRAY, who was in command of volunteer troops in the Philippines in 1899, was born in Marietta, O., February 10, 1837. In the Civil War he served with the Twelfth and Twenty-third Ohio Volunteers, was twice wounded, and was promoted to the rank of lieutenant-colonel. After the war he turned his attention to journalism, and became editor of the *Los Angeles Times*. He became brigadier-general of volunteers in 1898, and was sent to the Philippines, where he led the American forces at the capture of Calocan, Luzon, February 10, 1899.

OXYCAMPHOR. Alfred Ehrlich published in 1899 the results of his observation of oxycamphor, or oxyphor, an antidyspneic and sedative. It is a new derivative of camphor, in which a hydrogen atom is replaced by a hydroxyl molecule. It is a white, crystalline, odorless, somewhat bitter powder, soluble in cold water (1 to

50), readily soluble in hot water and in alcohol. It is ruined by exposure to light and moisture, changing into a soft, slimy, sticky mass of yellowish-white color. It remains unchanged in tablet form or as a 50 per cent. tincture. It is not always well borne by the stomach. The best results were obtained in the dyspnoea of tuberculosis and in cardiac dyspnoea.

OYSTER FISHERIES. See FISH AND FISHERIES (paragraph United States Fish Commission).

OZONE. See WATER PURIFICATION.

PADEREWSKI, IGNACE JAN, the famous pianist, was born in Podolia, Russian Poland, November 6, 1860. He played the piano at the age of three, and was taught seriously at the age of seven. In 1872 he went to Warsaw, to study under Roguski and Kiel, and he made a tour through Russia, Siberia, and Roumania. In 1878 he became a professor in the Warsaw Conservatory and in 1884 in the Conservatory of Strassburg; but he left to study under Leschetitzky in Vienna. In 1887 he made a successful *début*, and visited several continental cities. In 1889 he attracted great attention in Paris. In 1890 he appeared in London with great success, and early in 1892 went to the United States, where he gained a fortune. He returned to America in 1896 and again in 1899, having played in the meantime in Europe. He has composed more than eighty works. His *Polish Fantasia* was first performed at the Norwich Festival in 1893.

PEDIATRIC SOCIETY, AMERICAN, organized in 1888; in 1899 had 57 members. President, Henry Koplik, M.D.; secretary, Samuel S. Adams, M.D., 1 Dupont Circle, Washington, D. C. General meeting for 1900, Washington, May 1-3.

PAGET, Sir JAMES, F.R.S., D.C.L., LL.D., M.D., first baronet, one of the famous English surgeons of the century, died December 30, 1899. He was born January 11, 1814, and was educated at St. Bartholomew's. Since 1863 he had been surgeon to the Prince of Wales, and since 1877 sergeant-surgeon to Queen Victoria. He had for many years been consulting surgeon of St. Bartholomew's Hospital, and was a corresponding member of the Institute of France. He became a member of the Royal College of Surgeons in 1836, and in 1843, after some brilliant medical operations, he was made an honorary fellow of that institution. In 1875 he was elected its president. He was vice-chancellor of London University from 1884 to 1895. His baronetcy was created for him in 1871 in recognition of his many discoveries in surgery. Ten years later he was appointed a minister of the royal commission to inquire into the condition of the London hospitals for smallpox and fever cases. In the following year, at the jubilee commemorating the three hundredth anniversary of the founding of the University of Würzburg, he was one of the foreign scientific celebrities who received honors. He was a fellow of the Royal Society and of many other societies and institutions. Among his best-known publications are *Lectures on Surgical Pathology*; *Records of Harvey*; *Pathological Catalogue of the Museum of the College of Surgeons*; and *Results of the Use of the Microscope*. He also contributed extensively to the transactions of the Royal Society.

PAILLERON, ÉDOUARD JULES HENRI, dramatist and member of the French Academy, died April 20, 1899. He was born in Paris, September 17, 1834. He was clerk in a notary's office, but turned to literature, and in 1860 published a comedy, *Le Parasite*, and a volume of satirical poetry. He wrote the following plays: *Le Dernier Quartier*, presented at the Théâtre Français in 1863; *Le Second Mouvement*, 1865, brought out at the Odéon; *Le Monde où l'on s'amuse*, 1868, produced at the Gymnase; *Faux Ménages*, 1869; *Hélène*, 1872; *L'autre Motif*, 1872; *Petite Pluie*, 1885; *L'Étincelle*, 1879; *L'âge Ingrat*, 1879; *Le Chevalier Trumeau*, 1880; *La Souris*, 1887; *Cabotins*, 1893. He wrote *Le Monde où l'on s'ennui*, produced at the Comédie Française in 1881, and its success was so great that he was elected to the Academy in the following year. Pailleron wrote also the following volumes of poems: *Amours et Haines*, 1869; *Prière pour la France*, 1871; *La Poupée*, 1884; *Discours Académiques*, 1886.

PAINTING. Europe.—Two of the most interesting events of the year 1899 were the celebration of the third centenary of the birth of Velasquez, held in Madrid on June 3, and the Van Dyck exhibition held in Antwerp from August 12 to October 15. The Knights of the Order of Santiago, of which Velasquez was a member, paraded in his honor, and a hall in the Prado, dedicated to Isabella of Braganza, was established. Thirty-nine of the great painter's masterpieces were placed there, including the "Adoration of the Kings," "The Surrender of Breda" (Las Lanzas), "Philip IV.," "Anne of Austria," and the "Infantas." A literary and musical celebration was given, at which Spanish music of the sixteenth century was performed under the direction of Philippe Pedrell, and a statue by Romanos

was unveiled by the young King. The Van Dyck celebration consisted also of a procession and festivities, and 120 masterpieces, several of which were lent by the Duke of Devonshire, were exhibited.

At the exhibition of the Royal Academy Mr. Alma-Tadema contributed a picture of unusual size for him, entitled "*Thermæ Antoninianæ*," the Baths of Caracalla. The foreshortening of the central figure is a masterly example of drawing, and the detail of the whole work is superbly executed. Two pictures of Queen Victoria's Jubilee also attracted notice. The one was John Charlton's "*God Save the Queen*," showing the portico of St. Paul's seen from the south corner, with the Queen's carriage in the centre. Conspicuous is a fine group of Indian cavalry in blue and red, with head-gear of cloth of gold. The Queen's famous cream-colored horses in their crimson trappings are beautifully painted, as well as the horses of foreign princes near Queen Anne's statue. The gentlemen-at-arms, the yeomen of the guard, and the dignitaries of church and state afford splendid masses of color. The other was Gow's picture, "*St. Paul's: the Queen's Diamond Jubilee*"; it was full of animation, light, and color. The figures are larger than Mr. Charlton's, and the portraits are particularly fine. The scene chosen is the moment when the Archbishop of Canterbury bestowed his benediction upon Queen Victoria sitting in her carriage. This picture is the gift of Mr. Henry Clarke to the Guildhall. Sir E. J. Poynter contributed only a portrait of the "*Hon. Violet Monckton*," in white, seated on a garden bench; Mr. Watts also contributed but one picture, the portrait of the Right Hon. Gerald Balfour; Mr. F. Goodall sent a portrait of Mr. Gladstone, and also "*On the Road to Mandalay*." The Royal Academy elected on January 31, 1899, for associates, A. S. Cope and A. East, painters, and W. Goscombe John, sculptor; as honorable foreign academician, M. Jules Breton was selected out of eighteen candidates.

One of the most important exhibitions of the year was that of Sir Edward Burne-Jones's works at the Royal Academy. Of the 225 works, 130 were oil paintings, and happily illustrated the genius of the painter. It was generally concluded that the artist was more reminiscent of Botticelli than of Rossetti, and that his works fully illustrated the fact that "a picture is a painted poem." Sir Philip Burne-Jones exhibited in the garden-studio, Lisgar Terrace, West Kensington, about 50 of his father's pictures, some of which were unfinished. The following examples were shown: "*Venus Concordia*," "*Venus Discordia*," "*Love's Wayfaring*," "*The Fall of Lucifer*," several replicas of the "*Perseus*" series, "*Fortitude*," a beautiful pastel for a large picture, "*The Sirens*," and many others.

A remarkable exhibition was held at the Royal Academy of Rembrandt's pictures from English private collections.

Particularly fine was a magnificent collection of Turner's exhibited at the Guildhall Gallery, comprising 160 of Turner's pictures and drawings, and also choice impressions from the "*Liber Studiorum*."

Turner's superb "*Raby Castle*" formed the feature at an exhibition in the French Gallery. This masterpiece was painted about 1818, and was exhibited in that year. It was added to the Raby gallery by the late Duke of Cleveland. Not only does it represent a poetic view of the castle, but its clouds and light and delicate grading of tones and tints are rendered with a magical brush. Dogs are cleverly used in the foreground to show the undulations of the ground. The exhibition at the New Gallery contained many fine works, the most noticeable being Holman Hunt's "*Miracle of Sacred Fire in the Church of the Sepulchre, Jerusalem*," and Mr. Watts's "*Dedication*," showing an angel kneeling before an altar, and his "*Portrait of Lord Roberts of Kandahar*."

Among the minor exhibitions were twenty selected pictures by Italian masters at Agnew's; pictures by living artists of the French school at the Continental Gallery, including works by Anders, Bertolon, De Breanski, Checa, Darien, and Veber; Byam Shaw's pictures, interpreting passages of British verse; A. Severn's landscapes, and Gaston la Touche's impressionist pictures at the Fine Art Society. At Egyptian Hall were shown English landscapes by R. W. Allan, Aumonier, Hill, Peppercorn, Thompson, and Waterlow; F. Thaulow's pictures were exhibited at the Goupil Gallery; Verestchagin's at the Grafton Galleries; Von Glehn's 58 paintings, at the Goupil Gallery; modern Dutch paintings at Tooth's; and there were exhibitions by the Society of British Artists, miniature painters, Society of Painters in Water Colors, and Society of Women Artists. Mr. Watts exhibited at Messrs. Agnew and Sons, a small but poetical painting, "*The Good Samaritan*"; the victim lying naked in the road, while the rescuer, who has alighted from his mule, feels the man's side. The glow of the sky and the twilight effects are particularly fine. Alma-Tadema exhibited at Tooth's his "*Conversion of Paula*," which attracted so much attention at the Royal Academy in 1898, and late in the year placed his "*Thermæ Antoninianæ*" on view.

A new organization, the Pastel Society, was formed, and held its first exhibition

in the galleries of the Institute of Painters in Water Colors. Watts, Abbey, Boughton, Walter Crane, and Rolshoven contributed. The motive of this new society is to encourage pastel painting in England. The Royal Water Color Society had an excellent array of landscape. The Royal Glasgow Institute of the Fine Arts held its thirty-eighth annual exhibition; the Arts and Crafts held an important exhibition in October-November, reserving one room for the late William Morris's works; there was an autumn exhibition of pictures and sculpture at Liverpool; an exhibition of works of Sir Alma-Tadema and other noteworthy Dutch artists at the Holland Fine Arts Gallery; an exhibition of Henry and Albert Moore's works at Collingham, Maresfield Gardens; R. Caton Woodville placed on view his famous "Charge of the Twenty-first Lancers," and there were many minor exhibitions.

The National Portrait Gallery acquired an oil painting of "Jane Welsh Carlyle," by Samuel Lawrence; "Alexander Pope," by Sir Godfrey Kneller; "William Carr, Lord Beresford," by E. Beresford; "Admiral Sir George Rooke, K.B.," by M. Dahl, and "J. W. M. Turner," drawn in colored chalks by Charles Turner; "Earl Cowper," by Sir Godfrey Kneller, and a "Portrait of Queen Victoria," by Sir George Hayter (presented by the Queen). The National Gallery received a "Virgin and Child," by Francesco di Giorgio (an example of early Siennese art). The National Gallery of Edinburgh (which had no less than 72,000 visitors during 1899) acquired a portrait by Raeburn; Hogarth's full-length portrait of "Sarah Malcolm" (the Temple murderess), painted just before her execution in 1733 (a bequest from Lady Jane Dundas), and Wilkie's "The Gentle Shepherd." The British Museum was enriched by some small panels painted in encaustic in the decoration of a villa at Boscoreale—a group of Dionysus, Silenus, and a panther, two marine views, and two groups of birds, colored with much spirit—also a large mosaic representing Amphitrite, with two female attendants, rising from the sea. The National Gallery, London, obtained three new Rembrandts for the Dutch Room.

A reputed Rembrandt was discovered by Sir J. C. Robinson in a remote country house in Wales. The picture is 5 x 4 feet, painted on an oak panel, and is in a perfect state. It is a still-life study, representing a pile of vellum-bound books and papers, plaster casts of busts, an hour-glass, a steel cuirass, and a skull crowned with laurel. A large placard attached to the table, on which three objects stand, bears in Roman letters, "Servare modum, finemque tueri, Naturamque sequi." The signature, "Van Ryn, f. 1621," is placed below. This "Vanitas" picture occasioned much discussion. It was exhibited at the Burlington Arts Club. Another supposed Rembrandt, representing a handsome youth, was discovered in a Baptist church in Amsterdam. It is thought to date from 1632. Several wall paintings in distemper, representing scriptural subjects, were uncovered during the repairs of the church of Ashmansworth, near Highclere. Some of the paintings date from the thirteenth century.

Two civic pictures attracted great attention in London, both for their subjects and the skill with which they were treated. One was the work of Mr. Stanhope Forbes, who was commissioned by the authorities of the Sun Fire Insurance to paint one of the panels for the Royal Exchange. His large picture represents the "Great Fire of London," as described by Pepys. The scene is a quay at Thames side, where a crowd of men, women, and children are struggling to embark at early dawn. "Volumes of flame issue from the casements behind the fugitives, among whom are a sick boy who is being carried to one of the shallops at the foot of the steps, several other children in great distress, and sundry watermen and sailors. The figures are life-size, well and boldly drawn, and marked by a sense of style such as is not often found in English pictures as large as this. The artist's touch is firm and telling, his light and shade massive and effective. The expressions are appropriate, and the attitudes are spirited and natural. The river's surface, shining brightly in the combined lustre of the sky and the burning town, is turned to good account." The second was undertaken by Mr. E. Crofts for one of the panels of the Royal Exchange Arcade. This is the gift of the Mercer's Company to London, and represents Queen Elizabeth opening the first Royal Exchange.

The two Salons held their exhibition together for the last time in the Great Hall of the Machinery Annex, for the two societies, the Société des Artistes Français (the Old Salon) and the Société Nationale des Beaux Arts (the New Salon), will no longer exhibit under the same roof, as the galleries of the Palace of Art at the Exposition of 1900 will not be sufficiently spacious to contain the two collections of contemporary French art.

Old Salon: Last year Henner won distinction by his "Levite of Ephraim"; this year his "Portrait of an Old Woman" and "Dead Christ" were especially notable. Jean Paul Laurens, president of this society (which has gained 1000 members

since 1808), exhibited a ceiling intended for the *Galérie des Illustres* at Toulouse, glorifying the "Victory of Toulouse over Simon de Montfort." Toulouse is represented as a lamb, overpowering the lion, De Montfort, while the Muses, poets, and warriors symbolize Toulouse's glory. Albert Laurens, son of the president, had a fine "Portrait of his Brother, Pierre," and a painting of "Venus Welcomed by the Horæ." Pierre Laurens sent a portrait and "Sailors at the Capstan." The medal of honor was given to F. Tattegrain, his competitors being Henri Martin, Ferdinand Humbert, and Marcel Baschet. Paul Chabas won the Salon prize, and nine travelling scholarships were awarded—three to painters, three to sculptors, two to architects, and one to an engraver.

New Salon: Carolus Duran succeeded the late Puvis de Chavannes as president, and the picture that attracted most attention was the latter's portrait of "Mme. Puvis de Chavannes, née Cantacuzène," who died a few months before her husband. This portrait belongs to the Lyons Museum. Carolus Duran's "Christ Upon the Cross" was much admired. He also sent two portraits. Dagnan-Bouveret contributed a fine portrait.

The Louvre received as a bequest from the Baroness Nathaniel de Rothschild her famous Greuze, "La Laitière," and twelve pictures of the early Italian school: to the Musée Carnavalet she left a portrait of Mme. Geoffrin by Nattier, and a portrait of Lucie Desmoulins, by Boilly. The "Océanide" of Chassériau was recovered from the Cour des Comptes, Paris, and transferred to canvas for the Louvre. The Louvre also acquired the famous painting by Ingres of "L'Odalisque Couchée," one of his most characteristic works, painted in 1814, a commission from Queen Caroline of Naples; a series of fourteen pictures found in the house of Gustave Moreau, forming a "Chemin de Croix," were placed in the new Moreau museum.

Ferdinand Humbert finished the mural decorative pictures in the Panthéon—eight panels—"Faith," "Patriotism," "The Family Tie," and "Charity"; the panels left unfinished by Puvis de Chavannes have been completed by Cazin. Joseph Israëls also completed his "Saul and David," on which he had been engaged for years.

There was an exhibition of the works of Adolph Schreyer in the National Gallery, Berlin; an important collection of pictures by Lucas Cranach was on view in Dresden from April 20 to September 15, some paintings being sent from Hungary; and the École des Beaux-Arts exhibited 300 oils by the late Eugène Boudin, besides water colors and drawings. There was also an exhibition at the Villa Medici, Rome, presided over by M. Leygues, minister of public instruction in France, and honored by the presence of the Queen of Italy; and the inauguration of the Hall of the German Embassy at the Palazzo Caffarelli took place, the frescoes of which were executed by Professor Hermann Prell, inspired by Emperor William. Prince Chigi sold at auction in Rome his "Madonna and Child," by Sandro Botticelli, which belongs to the cycle of the "Vierge aux Roses," in the Louvre. The Virgin Mary holds the infant Christ in her lap, while an angel offers him grapes and ears of grain. The picture was sold for £12,600 (315,000 lire) to a purchaser, said to be bidding for the Rothschilds. This Botticelli was the gem of the Chigi collection. The polyptych of the fifteenth century in the Church of San Sisto at Viterbo, a masterpiece of the early Siennese school, also left Italy.

There was an upward tendency in prices in Paris and London. The famous Bordini collection passed under the hammer, realizing £21,699, and also the collection of old masters formed by H. F. Broadwood, the collection of the late Sir John Fowler, Sir J. Kelk, and others of note. The Fowler sale reached £65,355; the Kelk, £22,000; the Miles, Methuen, £35,000; the Sykes, Napier, and Ettrick, £20,000; the Marlborough gems sold for £34,827; the Vienna collection for £21,699, and the Miéville collection for £41,751. The most notable picture of the year was Sir John Fowler's "Landscape," by Hobbema, which brought 9550 guineas, the highest price ever given for a Hobbema. There was a great demand for Turners and other English masters, especially for works of Hoppner and Raeburn, and pastels by J. Russell. Franz Hals was also in demand. Botticelli's "Holy Trinity and Saints" fetched 1100 guineas; Troyon's "The Dairy Farm" sold for £6720; "Cattle Market and Fair in France by the Sea," £3780, and "A View on the French Coast," £2600; Sir John Fowler's "La Petite Mathématicienne," by Greuze, reached 1600 guineas; Sir J. Kelk's Constable's "Views of Salisbury Cathedral" reached £1365, and "Hook's Acre by the Sea, Cornish Coast," £441. Millais's "The Minuet" (for which his daughter posed), sold for 4500 guineas. Turner's "Port Ruysdael," a magnificent picture of a stormy sea (which in 1863 sold for 1995) reached 4800 guineas at the Kelk sale, and his "Venice" 8200 guineas at the Fowler sale. Rosa Bonheur's "Going to Covert" reached 800 guineas at the Kelk sale, and her "Highland Cattle and Sheep" 1450 guineas at the Fowler sale. Sir Joshua Reynolds's "Strawberry Girl" sold for £472; Berkheyden, "Buildings on a Canal," £173; Franz

Hals, "Head of a Youth in a Red Cap," £110; K. du Jardin, "Portrait of the Artist," £173; Jan van Ravestein, "Portrait of an Old Woman in Black," £220; Rembrandt, "Head of a Rabbi," £278; H. Fragonard, "The Coquette," £210; Francia, "The Madonna and Child," £152; J. Ruysdael, "A Landscape, with Cottages and Windmill," £147; Botticelli, "Madonna and Infant Saviour, with St. John and an Angel," £168; J. Hoppner, "Portrait of a Young Girl with a Blue Kerchief around her Head," £168; G. Morland, "A Winter Scene," £199, and N. Lancret, "A Woody Lake Scene Near a Castle," £1071; Sir John Gilbert's "Scene from King John" fetched £48; "Rosalind and Celia in the Forest of Arden," £52; "Italian Piper and Attendant," £62; V. Cole, "Holmburg Hill," £100; Rossetti's "Jehanne la Pucelle," £90; Sir Joshua Reynolds's "Portrait of John H. Hutchinson and His Wife," the property of the Earl of Donoughmore, fetched 1250 and 2300 guineas; 1500 guineas were paid for Sir J. Watson Grahame's "Portrait of Sir Walter Scott," and a Botticelli, discovered by Sir Henry Layard in an Italian pawnshop, fetched 1100 guineas; Watteau's "L'Accordée du Village," at the Broadwood sale reached 1250 guineas, and his "La Musette," 1380 guineas; a portrait by Boucher, 1050 guineas, and J. B. Pater's "Wedding Party," 500 guineas. At the Bardini sale a "Judith" by Botticelli, similar to the "Judith" in the Uffizi, realized £1100. Paolo Uccello's "St. George and the Dragon," £1450. Paris Bordone's "Baptism of Christ" reached 1070 guineas; a Cuyt at the Miéville sale brought 980 guineas; a bouquet of flowers by Jan van Huysum, 700 guineas; a landscape by Ruysdael, 850 guineas; Jan Steen's "The Doctor's Visit," 195 guineas; Rubens's "Holy Family" at the Leigh Court sale reached 8300 guineas. Romney's "Lady Hamilton as a Bacchante" sold for 4300 guineas; Romney's "Mrs. F. Newberry," 1650 guineas; Sir Alma-Tadema's "Listener," 745 guineas; Bonnington's "Scene on Coast of Normandy," 1700 guineas; W. Collins's "Sunday Morning," 1380 guineas; Sir E. Landseer's "Ptarmigan Hill," 2000 guineas; Turner's "View of Oxford," 4200 guineas. A high price (3000 guineas) was paid at the Fowler sale for Turner's water color, "View of Lake Nemi."

At the Doria sale in Paris Durand-Ruel paid 22,000 francs for "La Danseuse chez le Photographe," by Degas; 22,100 for Renoir's "La Pensée"; 7200 for Manet's "Jeune Femme"; \$7000 for Monet's "Bateaux sur la Fleuve"; 34,500 for Corot's "Lake in Italy"; 21,000 for Rousseau's "Vallée d'Auvergne"; 16,100 for Jongkind's "Rue de Delft"; 46,500 for Daumier's "Compartiment de Troisième Classe," and 19,500 for Delacroix's "Chasse aux Lions." At the same sale Millet's "Young Shepherdess" fetched 17,800, his "Rentrée des Vaches" 6300, and "A Squall" 2500 francs. "Le Rêve," by Bouguereau, sold in Paris for 13,200 francs; Sisley's "Route aux Environs de Marly," for 9300 francs; Girard's "Portrait of Napoleon I. in his Coronation Robes" fetched 16,500 francs; Delacroix's "Medea," 40,500 francs, and Nattier's "Portrait of the Duchesse de Chateauroux," 18,000 francs. At the Schubert sale in Munich, Rubens's "Bath of Diana," with a copy by H. van Balen, reached 126,000 marks; Rubens's "Ascension," 6200 marks; a Jan Steen, 8000 marks; Ruysdael's "Dutch Winter Landscape," 10,800 marks; Lucas Cranach's "Madonna with the Cake," 9000 marks, and "Nymph Reposing at a Well," 9150 marks. Christopher Amberger, two portraits, 51,000 marks; Watteau's "Musical Entertainment in the Open Air," 23,000; Wouwerman's "Farriers on a Hill," 19,000, and G. Dow's "Housekeeper," 35,000 marks.

United States.—The seventy-fourth exhibition of the National Academy of Design was held from April 3 to May 13. Horatio Walker's "Oxen Drinking," Childe Hassam's "By the Sea," Frederick Remington's "Missing," and George H. Bogert's "September Evening" were noticeable. Miss Matilda Brown's "The Last Load" won the Dodge prize, Edward Potthast's "The Carpenter" the Clarke prize, G. H. Bogert won the first Hallgarten prize, L. P. Dessar the second Hallgarten, and Carle J. Blenner the third Hallgarten.

Frederick Dielman was elected president of the National Academy of Design.

The Society of American Artists held their spring exhibition as usual at the American Fine Arts Society Building. Dagnan-Bouveret's "The Disciples at Emmaus," purchased for the Carnegie Art Gallery, Pittsburg, was exhibited. Whistler's "Music Room," Charles Hopkinson's "Little Red Head" and "Expectation," Sargeant Kendal's "Portrait of a Lady," Will H. Low's "Four Seasons," were conspicuous. Kenyon Cox's frieze for the new Appellate Court Building—"Mercury and Ceres"—was also shown. Douglas Volk took the Shaw prize with his "Woodland Maid," and Mr. Lathrop's "Clouds and Hills" carried off the Webb prize.

At the tenth annual water color exhibition, at the American Fine Arts Society Building, Albert Herter's "Patricia" held the place of honor. Albert Herter's "Gift of Roses" gained the Evans prize. The Ten American painters held an exhibition at Durand-Ruel's, where works by Robert Reid, Decamps, Childe Hassam, Twachtman, J. Alden Weir, Benson, Edward Simmons, and T. W. Dewing were

shown. Twelve artists withdrew from the Society of American Artists to form the Society of Landscape Painters. At their first exhibition works by Bruce Crane, Frederick W. Kost, C. Davis, Walter Palmer, Walter Clark, Leonard Ochtman, Robert C. Minor, J. F. Murphy, George H. Bogert, R. H. Gifford, and William A. Coffin were shown.

The "Portrait Show" at the Academy of Design attracted many visitors. Among the most interesting pictures may be mentioned Whistler's "Girl in White," Sir Joshua Reynolds's "Strawberry Girl," Sargent's "Portrait of Calvin S. Brice," A. L. Zorn's "Portrait of Susan White Hildreth," A. de la Gandara's "Portrait of Mrs. Burke-Roche," and Raymundo de Madrazo's "Portrait of the Duchess of Morny."

On Founders' Day (November 2) at the Carnegie Art Galleries, Pittsburg, prizes were distributed. Cecilia Beaux won a gold medal and \$1500 for her "Mother and Daughter," F. W. Benson a silver medal and \$1000 for "The Sisters," and André Sanchez a bronze medal and \$500 for "The Boats." Lucien Simon and J. H. Twachtman received honorable mention. It is estimated that 469,000 persons visited this gallery within the past year.

The Boston Art Students' Association gathered an interesting collection of Sargent's works and exhibited them at Copley Hall. The Yale School of Fine Arts awarded to John Alden Twachtman the William Wirt Winchester fellowship of \$2000, providing two years' study abroad. The Page travelling fellowship of the Boston Museum of Fine Arts was given to Miss Mary B. Hazelton, an assistant teacher of drawing in one of the schools of the museum. The Colonial Dames of Massachusetts offered two prizes for a second exhibition of historical pictures, to be held at the Boston Art Club in December, 1899, the purpose being to stimulate an interest in the early days of the country.

The Boston Museum of Fine Arts purchased Turner's magnificent "Slave Ship," and the Metropolitan Museum of New York was enriched by Turner's "Grand Canal at Venice," valued at \$100,000, the bequest of Cornelius Vanderbilt. The spring opening of the Metropolitan Museum revealed several important gifts. Edward Brandus presented "St. Peter's Repentance," by Ary Scheffer; Jacob Schiff, Henry Mosler's "A Wedding Feast in Brittany"; Lyman G. Bloomingdale, George Inness's "Pine Grove of the Barbarini Villa," and Charles Sprague Pearce, George Inness's "The Delaware Valley" (from the Clarke collection).

When the Walters Gallery in Baltimore was opened several new pictures were noticed: Fortuny's "Arab Fantasia" (from the Stewart sale); two portraits by Van Dyck, one by Sir Peter Lely of Charles II.; a portrait by Sir Thomas Lawrence, and a "Holy Family," by Bonifacio, were among them.

A new gallery was added to the Chicago Art Institute by Mr. and Mrs. C. H. McCormick, in memory of Mrs. E. S. Stickney.

The important sales in this country were the Clarke, the Havemeyer, the Harris, Holbrook, Blakeslee, the Evans, and the Mendonça. The Clarke sale brought together 31 Winslow Homers, 39 George Innesses, 7 of Homer D. Martin, and examples by George Fuller, William M. Hunt, and William T. Dannat. George Inness's "Gray Showery Day" reached \$10,150; George Fuller's "Romany Girl," \$4100; George Inness's "Delaware Valley," \$8100; "Wood-Gatherers," by the same artist, \$5600; Winslow Homer's "The Life Line," \$4700, and his "Maine Coast," \$4400; and Homer D. Martin's "Adirondack Scenery," \$5500. At the Havemeyer sale Inness's "Georgia Pines" fetched \$1000; "Sunset-Star Island," by De Haas, \$1100; "In Strange Seas," by George W. Maynard, \$500; Benjamin West's "Design for a Monument to Admiral Nelson," \$250; and Edward Savage's "Washington and His Family at Mount Vernon," \$3000. \$20,930 was realized altogether.

The total reached at the sale of old English and Dutch and modern French masters from the collections of Dr. E. M. Harris, of Providence, Edward Holbrook, and Mr. Blakeslee, was \$173,515. The highest price was paid for Mr. Blakeslee's "Portrait of the Earl of Arundel," by Van Dyck, \$8500; Van Dyck's "Portrait of Lord Dudley" fetched \$4100; Sir Joshua Reynolds's "Lady Mary Nugent Temple," \$4700; a Coello brought \$1750; Van Ravesteyn's "Portrait of a Dutch Lady," \$800, and "Elizabeth Brandt," \$1900; Pieter Codde's "Princess Palatine," \$6500 (bought by the Willstack Museum, Philadelphia); Diaz's "Diana and Her Nymphs" fetched \$7800; Corot's "Le Rousseau Sous-Bois," \$4900; Dupré's "The Old Oak," \$3300; Daubigny's "Coteaux de Villeneuve St. George," \$4000; Diaz's "Wood Interior," \$5300; Decamps's "Le Boucher Turc," \$5500; Corot's "Bord de l'Etang," \$5500; Rousseau's "Gorges d'Apremont," \$3500; Gericault's "The Quarry Team," \$5100; while a landscape by Gainsborough reached but \$900. The collection of William T. Evans included pictures by Homer D. Martin, George Inness, Chase, Homer, Cox, Weir, Church, Bridgman, Curran, and Walker.

Among the minor exhibitions we may mention Carolus Duran's pictures at Boussod-Valadon's; thirty paintings by the late Alfred Sisley at Durand-Ruel's;

figures by Monticelli and landscapes by Michel at Avery's; landscapes by William A. Coffin at Knoedler's; twenty-four paintings by Julian Rix at Schaus's; Charles Caryl Coleman's "Moonlight at Capri," "Azaleas and Vesuvius," and other Neapolitan scenes, at Avery's; portraits by William Thorne and landscapes by Alexander Harrison at Boussod-Valadon's; pictures by Charles Rollo Peters, a California landscape painter, at the Union League; J. F. Raffaelli's oils, pastels, and etchings at Durand-Ruel's; Herman G. Herkomer portraits were shown at Boussod-Valadon's; Frederick A. Bridgman's at Boussod-Valadon's; Carle J. Blenner's portraits and Inness's "Winter Morning at Montclair" at the Oehme galleries; William M. Chase exhibited his Velasquez, "Las Meninas"; Holbein's "Portrait of Cardinal Fischer," shown at the Alsace-Lorraine Exhibition of 1864, was exhibited at Durand-Ruel's; Edward Brandus imported Rembrandt's "Man with the Cane"; Sargent's "Portrait of Calvin S. Brice" was shown at Schaus's; two recent works by Gerôme were exhibited at the new Carmer galleries; Rufus Zogbaum's picture of Admiral Dewey on the fighting-deck of the *Olympia* was shown at Schaus's; and "May-day Festival in the Time of Louis XIV.," by a new Italian painter, Andriotti, at Fishel, Adler, and Schwartz's.

A loan exhibition of paintings by Claude Monet attracted much attention at the Lotos Club; the Salmagundi Club exhibited works by Frank Russell Green, Edward Potthast, J. Francis Murphy, George Elmer Brown, H. Bolton Jones, Bruce Crane, Homer Lee, W. J. Whittemore, Carle J. Blenner, Herbert A. Levy, and others. Turner's "The Funeral Cortège of Lord Nelson Departing from Greenwich Hospital" fetched \$3300. It was purchased by C. R. Flint, who also bought Franz Hals's "Portrait of a Professor" for \$2000. William Clausen bought Raeburn's "Portrait of Lord Byron" for \$2000; G. W. Thorne, a so-called Paul Veronese for \$2500; Corot's "Berger jouant avec une Chevre" reached \$4600, and F. L. Loring acquired a "Magdalen," attributed to Murillo, for \$4550. The Bridgman pictures realized \$15,500 at their special sale. "The Music of the Past" fetched \$4000, "The Fête of Ourdel-Kebir" \$800, and "Our Neighbors: Women of Constantinople," \$700.

PALEONTOLOGY. Among the most important contributions of the year is the *Geschichte der Geologie und Palaeontologie*, by Karl von Zittel, and *Bibliographic Index of North American Carboniferous Invertebrates*, by S. Weller, *Bulletin*, 153, United States Geological Survey.

W. E. Hobbs notes the presence of annelid remains in the Lincoln slate, near Boston, Mass. The age of these is between cambrian and ordovician, and they represent the oldest fossils thus far found in Massachusetts. G. F. Matthew reports the presence of a paleozoic terrane beneath the cambrian. Wortman describes the extinct *Camelidae* of North America and some associated forms; also the evolution of the *Amblypoda*. See GEOLOGY.

PAN-AMERICAN EXPOSITION will be held in Buffalo, May 1 to November 1, 1901, for the purpose of illustrating "the marvellous development of the Western Hemisphere during the nineteenth century by a display of the arts, industries, manufactures, and the products of the soil, mine, and sea." Congress has already appropriated \$500,000 for a government building and exhibits, including exhibits from Puerto Rico, Cuba, Hawaii, and the Philippine Islands. In January, 1899, the New York State legislature created the Exposition Association, with power to develop and direct an international exposition, and authorized it to issue \$2,500,000 of stock and \$2,500,000 of bonds; private subscription to the capital stock has been very large. The legislature also appropriated \$300,000 for a State building and exhibit. John G. Milburn is the president of the Exposition Association, and Edwin Fleming, secretary. Other States have also created commissions for state representation, and assurances have been received that the Dominion of Canada, Mexico, and the Central and South American republics will make unique, interesting, and instructive exhibits, peculiarly illustrative of their progress during the nineteenth century.

PARAGUAY, one of the two interior republics of South America, is bounded on the north by Bolivia and Brazil, on the east by Brazil and Argentina, and on the south and west by Argentina. The capital is Asuncion.

Area and Population.—The country is divided into 23 *partidos*, or counties, the total area of which is estimated at 98,000 square miles. Besides about 60,000 semi-civilized and 70,000 uncivilized Indians, the estimated white population in 1897 was 600,000, an increase of about 168,000 over the estimate of 1895. Hitherto immigration has been small, but is now being encouraged by the government. During the fiscal year 1899 the number of immigrants reported was 405; more than one-half of these came from Sicily. In 1895 the population of the principal towns was as follows: Asuncion, 45,000; Villa Rica, 19,000; Concepcion, 10,000; San Pedro, 8000; Luque, 8000.

Government.—By the constitution, which dates from November, 1870, the executive authority is vested in a president, elected for a term of four years, and assisted by a responsible cabinet of five members, appointed by himself and presiding over the following departments: The interior, foreign affairs, finance, worship and justice, and war. The president, for the term beginning November 25, 1898, is Señor Emilio Aceval. The legislative authority devolves upon a congress of two houses, a senate and a chamber of deputies, the members of both being chosen by popular vote, senators in the ratio of one to 12,000 inhabitants, and deputies one to 6000; a greater ratio, however, obtains in the sparsely inhabited districts. The *partidos* are administered by chiefs and justices of the peace, who are assisted by town and city councils. There are various inferior courts, with local magistrates, and a high court of justice.

Army and Navy.—The chief purpose of the army is the maintenance of order in the republic. There are infantry, cavalry, and artillery, numbering in all 82 officers and 1345 men. Citizens between the ages of twenty and thirty-five years are liable to military service. For river service there are a steamer of 440 tons and four guns, and two smaller steamers.

Finance.—The chief sources of revenue are customs, stamps, and sale of government lands. The budget for the fiscal year 1897 was estimated to balance at 5,462,475 pesos; of the revenue 3,562,560 pesos were reported as available for public service. The budget estimate for 1900 places the revenue and expenditure at 1,152,254 pesos, gold, and 8,065,781 pesos, paper, respectively. In the latter part of 1899 gold was at a premium of 700—that is, the gold value of the Paraguayan paper peso is about 15 cents. The outstanding debt in 1898 was £994,600 (\$4,839,723). In 1897 the guarantee debt to the Paraguayan Central Railway was £429,471 (\$2,089,806). The government is reported to owe to Argentina 12,393,600 pesos, and to Brazil 9,876,500 pesos. There are five banks. The chief circulating medium is paper, the amount now in circulation being about 5,957,000 pesos. Paraguay has no coin of its own stamping; the peso of other South American countries is current, and has the same values as in the countries of issue. The fixed values in United States currency of the peso of Argentina and Uruguay are \$0.965 and \$1.034 respectively.

Industries and Commerce.—The chief industry is the raising of *yerba maté*, Paraguay tea, but attention is also given to the rearing of cattle and the cultivation of tobacco, fruits, maize, mandioca, and beans. The estimated number of cattle in the country in 1899 was 4,000,000; this estimate, however, was probably too high. There are extensive forests containing valuable woods, but as yet the timber industry is little developed. About 100,000 hides are exported yearly to Buenos Ayres. The *maté* leaf exported in 1896 amounted to 5141 tons, and in 1897 to 6548 tons. About one-half the *yerba maté* produced in Paraguay is for local consumption, and the other half is exported. Sugar-cane grows readily in Paraguay, but no sugar is produced. Mining has not been developed, though copper, pyrites, and kaolin are found and iron is abundant in the north and marble in the south. Throughout the country there are rum (caña) distilleries, and in and about Asuncion are a number of breweries, flour-mills, tanneries, and match, soap, and brick factories. The leading imports are textiles, wines, and rice, and the most important exports are *yerba maté*, hides, timber, tobacco, and oranges. The value of the imports in gold pesos and of the exports in paper pesos have been reported: for 1896, imports 2,786,335, exports 12,292,000; for 1897, imports 2,203,459, exports 12,908,299. Nearly one-half of the imports come from Great Britain. The import of cotton textiles in 1898 amounted to \$186,325. In this year the total value of imports was about \$2,143,300 and the aggregate exports were valued at about 13,888,500 paper pesos.

Communications.—Transportation in the rural districts is difficult and expensive, as the roads, for the most part, are no better than paths. There is one railway, under private control, running from Asuncion to Pirapó, a distance of about 156 miles. Telegraph lines aggregate only 360 miles; the two principal ones are the line in connection with the railway and the line between Asuncion and Corrientes in Argentina. In 1897 the post-offices numbered 95. In the same year there entered the port of Asuncion 367 vessels of 132,592 tons.

Religion and Education.—Religious toleration prevails in Paraguay, but the state church is Roman Catholic. In 1896 the public and private elementary schools numbered 358; the enrolment was 23,000 pupils and 680 teachers. It is reported that in 1887 only one in five of the adult natives and three in five of the adult foreigners could read and write. Education is now free and nominally compulsory. Besides supporting the public schools the government grants small subsidies to the private ones. There is a national college at Asuncion with 15 professors and over 200 students. The capital also has a public library and five newspapers are published there.

The Plague.—In the early part of December, 1899, it was announced that the plague, or some very similar disease, had become serious in Paraguay. It first ap-

peared in the army, and cases of the disease became so numerous that the government, lacking adequate medical facilities, was obliged to ask the Argentine government for tents to accommodate the plague-stricken soldiers.

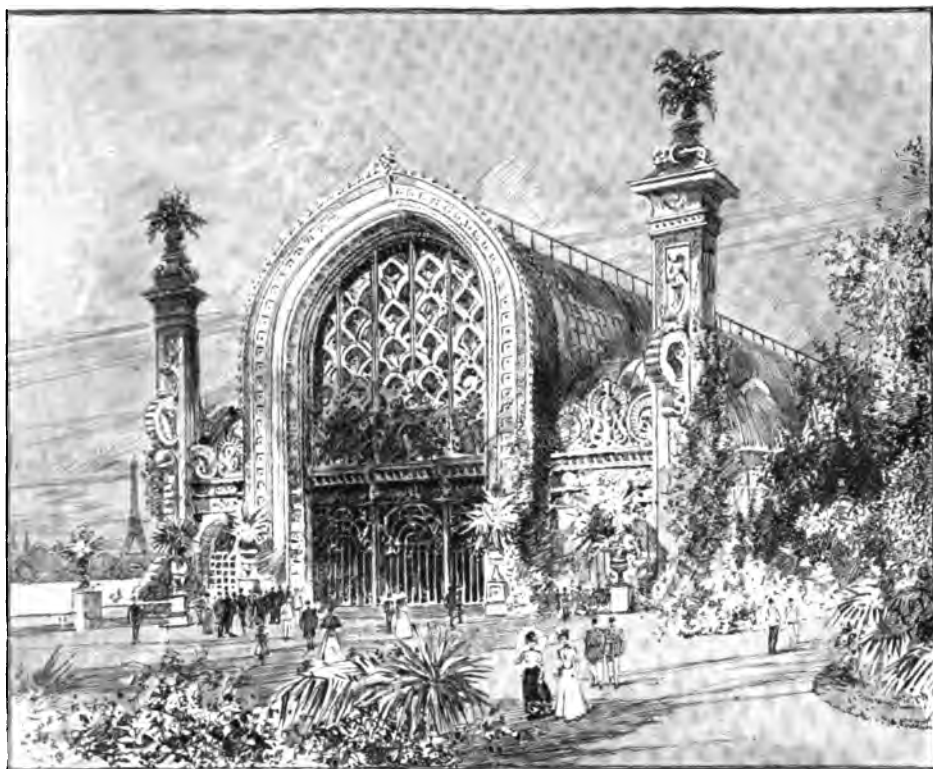
PARIS INTERNATIONAL EXPOSITION, THE, has been planned to be held in 1900 from April 15 to November 5. The exposition movement was officially inaugurated in July, 1892, when M. Jules Roche, who was then minister of commerce, addressed a communication on the subject to President Carnot. The latter, on the 13th of the month, issued a decree in which he proclaimed a "universal exposition of works of art and of industrial and agricultural products."

The cost of the exposition has been estimated at 100,000,000 francs (\$19,300,000), and this sum has been covered by a guarantee fund, consisting of 20,000,000 francs contributed by the French government, 20,000,000 francs contributed by the city of Paris, and exposition bonds for 60,000,000 francs. The fund will probably be allotted approximately as follows: Works, 73,000,000 francs; exploitation, 12,000,000 francs; administration, 8,000,000 francs; the reserve amount being 7,000,000 francs. Some of the more detailed, but still approximate, allotments in francs are: Palaces of the fine arts in the Champs-Élysées, 21,000,000; buildings in Champs de Mars, 18,000,000; mechanical and electrical service, 6,750,000; fêtes, 5,500,000; buildings on the Esplanade des Invalides, 5,000,000; bridges across the Seine, 5,000,000; circular railway, 1,500,000; buildings on the Quais, 1,500,000; fountains and gardens, 1,200,000; music, 1,200,000; the judges of exhibits, 1,000,000; lighting and illuminations, 800,000. The space covered by the exposition will probably be 12 per cent. greater than that of the Paris exposition of 1889. It will occupy the public grounds on both sides of the Seine, including parts of the Esplanade des Invalides, the Trocadéro, the Quai d'Orsay, the Quai de la Conférence, the Champs de Mars, the Cours de la Reine, and that part of the Champs-Élysées "where until recently stood the Palais de l'Industrie, a landmark of the Exhibition of 1855." There are numerous entrances to the exposition grounds, but the main entrance is to be off the Place de la Concorde, near the Seine. The number of admissions to the Paris exposition of 1889 was over 32,000,000; the attendance in 1900, it is estimated, will be over 50,000,000.

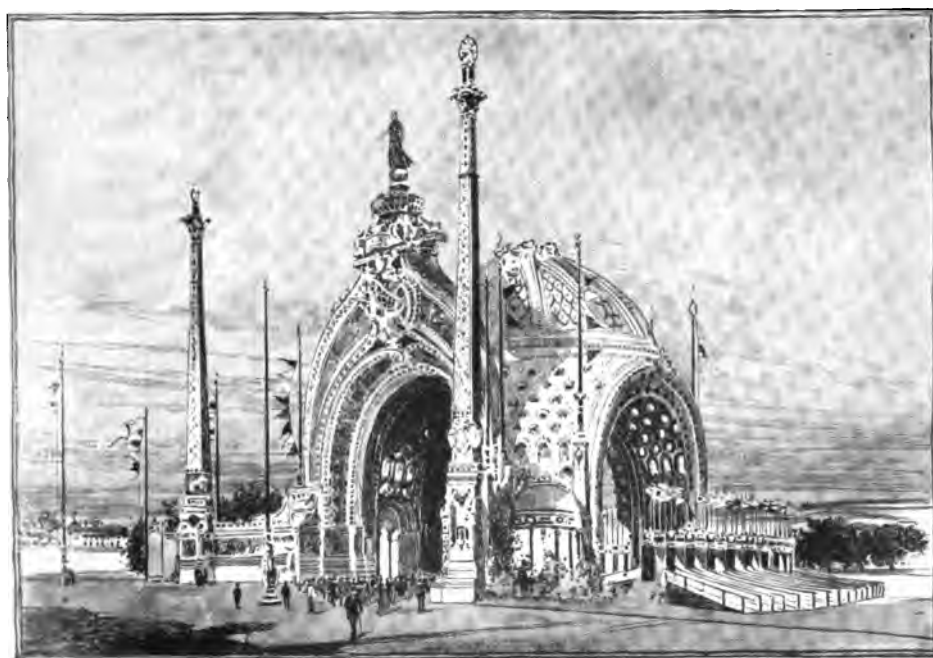
The exposition administration is divided into the following seven departments: "1. Secretariat-general, which deals with all matters of general business," such as employment, fire service, medical service, police, and the press; "2. Architecture, which deals with the erection of palaces and pavilions, control of metallic structures, and all devices erected by foreign nations, colonies, and industrial exhibitions; 3. Roads, streets, parks, gardens, and lighting; 4. Exploitation, which deals with French, foreign, and colonial sections, installations, the fine arts, agriculture, catalogues, and diplomas; 5. Finance; 6. Litigation; 7. Fêtes." The French minister of commerce, M. Millerand, has the general direction of the exposition, but executive power in the various sections is delegated as follows: Commissioner-general, M. Alfred Picard; director-general of exploitation, M. Delaunay-Belleville; director of finance, M. Grison; director of architecture, M. Bouvard; director of agriculture, M. Vassilière; director of fine arts, M. Roujon; director of streets, parks, etc., M. de France; director of litigation, M. E. Moreau; delegate for the colonies, M. Charles-Roux; general secretary, M. Henri Chardon.

The exhibits will be classified as follows: "1. Education and instruction; 2. Works of art; 3. Instruments and general methods of letters, sciences, and arts; 4. Machinery and processes of mechanism; 5. Electricity; 6. Civil engineering and transportation; 7. Agriculture; 8. Horticulture; 9. Forestry, hunting, fishing, crop-gathering; 10. Alimentation; 11. Mines and metallurgy; 12. Decoration and furniture of public buildings and dwellings; 13. Cotton fabrics, textures, and clothing; 14. Chemical industry; 15. Various industries; 16. Social economy, hygiene, and public assistance; 17. Colonization; 18. Territorial and naval armies." The jury, or judges of the exhibits, will comprise men of various nationalities, and the prizes awarded will consist of diplomas, the diplomas being those of honorable mention, bronze medal diplomas, silver medal diplomas, gold medal diplomas, and grand prize diplomas.

The interests of the United States at the exposition are under the direction of Mr. Ferdinand W. Peck, of Chicago, who was appointed commissioner-general by President McKinley on July 22, 1898. The space allotted to the United States at the exposition amounts to 200,000 square feet, and the appropriation made by Congress is \$1,210,000. At the Paris exposition of 1889 the appropriation was \$250,000, and the space allotment 113,300 square feet. The United States building, designed by Mr. Charles A. Coolidge, of New York, and M. Morin-Goustiaux, and situated near the Seine on the Quai d'Orsay, is 85 feet wide and 90 feet long, with a dome 160 feet high.



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PARIS EXPOSITION.—1. The Palace of Horticulture. 2. The Grand Gateway of the Exposition.

Among the official congresses of the Paris exposition of 1900 the following relate to political and social science: The International Congress of Friendly and Provident Societies will meet on June 7, continuing its session for four days. The attention of the congress will be given especially to societies of mutual aid, the various questions connected therewith, and to the question of old-age pensions. Three other congresses for the discussion of kindred subjects will also meet during the month of June: from the 11th to the 13th, aid societies for young workmen; June 18 to 21, cheap dwellings; June 25 to 30, labor accidents and society insurance. The International Congress of Workmen's Associations of Production will meet July 13-15 for the consideration of the philosophy of co-operation, co-operation from the industrial point of view, and the relations of production associations with supply societies. The International Congress of Profit Sharing will be held July 15-18, and will discuss the following questions: The method of determining the profit-share of employees; methods of sharing, *pro rata*, salaries, etc.; use of the amounts thus resulting; settlement of claims; management of funds: checking of accounts; consulting committees; financial and moral results of profit-sharing. The International Congress of Colonial Sociology will be held August 6-11, immediately following the International Congress of Colonial Economy. The political, juridical, moral, and material conditions of the natives will constitute the theme of the conference. The congresses named above, it may be seen, are so arranged that persons who choose may attend all.

PARKER, HORATIO WILLIAM, American composer, born at Auburndale, Mass., September 15, 1863, was educated in music by Stephen A. Emery, of Boston, and George W. Chadwick. In 1882 he went to Munich to study composition with Rheinberger and conducting with Ludwig Abel. His ballad, *King Trojan*, was performed in Munich in 1885. Returning to the United States, Mr. Parker became organist and choirmaster of Trinity Church, Boston, and was made professor of music at Yale. He has composed many excellent works, including *The Legend of St. Christopher* (New York, 1898) and *Hora Novissima*, performed with much success at the Festival of the Three Choirs, Worcester, England, in 1899, conducted by the composer. In 1899 he also won the prize of \$250 offered by the Musical Arts Society of New York for the best *a capella* chorus with a composition entitled *Astant Angelorum Chori*.

PARKS, PARKWAYS AND PLAYGROUNDS. Figures showing the acreage of parks in 15 American cities, with the total area of each city, its estimated population and expenditure for park maintenance during the last fiscal year are given in the accompanying table. The cities included are designed to be representative in size only; figures for places of less than 30,000 inhabitants were not available. In Baltimore the expenses of the park department are largely met by the revenues from street railways, paid the city as a percentage of gross receipts on account of franchise rights. For the year 1898, \$248,700 of the \$250,930 expended on the parks came from the street railways.

Greater New York has a number of fine parkways, especially in the boroughs of Brooklyn and Queens. The following may be named: Ocean Parkway, from Prospect Park to Coney Island, 5½ miles in length; Eastern Parkway and Extension, Prospect Park to Ridgewood Park, 4¾ miles; Fort Hamilton Parkway, Prospect Park to Fort Hamilton, 4½ miles; Bay Parkway, Ocean Parkway to Bensonhurst Beach, 3 miles; Shore Drive, Fort Hamilton Avenue to Fort Hamilton, 3 miles; total 20¾ miles. The Speedway, or Harlem River Drive, in old New York, is 22 miles long and up to January 1, 1900, had cost \$3,025,000.

On January 31, 1899, Boston had ten playgrounds, ranging in size from ¼ of an acre to 40 acres and aggregating 111¼ acres. On December 31, 1898, the city council accepted an act of the legislature authorizing it to purchase 20 additional playgrounds, at a cost not to exceed \$500,000, and not more than \$200,000 to be expended in any one year. In 1898, Milwaukee established an open-air gymnasium in one of its parks. Boston has had such a gymnasium and playground at Charlesbank for a number of years. Classes are held for boys at 4 P.M., and other classes at 8 P.M. There are baths here free to all, and in winter the gymnasium grounds are flooded for skating. There is a Woman's and Children's Division at the Charlesbank Gymnasium which for eight years has been under the direction of a committee of the Massachusetts Emergency and Hygienic Association. The total weekday attendance of women and children recorded by the committee during the season of 1898 was 144,787, or 999 a day; Sunday, 18,214, or 759 a day. The total gymnasium attendance for the season was 57,499, the larger portion including patrons of the kindergarten, sandpens, and grass plots. Morning, afternoon, and evening classes were held for women, and girls' classes twice a day, each for two days in the week during the summer. In the winter there are also evening classes under the direction of the committee.



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**PARKS AND PLAYGROUNDS.—1. The Public Playgrounds. 2. Seward Park,
New York City.**

AREAS AND COST OF MAINTENANCE OF PARKS IN FIFTEEN CITIES.*

CITY.	Estimated Population.	Area of City.	Area of Parks.	Cost of Maintenance for Fiscal Year.
New York, N. Y.....	3,500,000	196,900	7,887	.....
Chicago, Ill.....	1,850,000	119,889	2,151	\$356,186
Philadelphia, Pa.....	1,240,000	82,988	3,729	554,828
St. Louis, Mo.....	623,000	40,000	2,172	188,023
Boston, Mass.....	582,000	27,596	2,415	233,883
Albany, N. Y.....	100,000	8,867	200	59,167
Grand Rapids, Mich.....	99,000	11,300	131	19,190
Fall River, Mass.....	98,000	26,340	89	2,310
Atlanta, Ga.....	98,500	6,720	146	11,858
Nashville, Tenn.....	90,000	7,186	9	280
Joliet, Ill.....	30,000	3,010	100	.....
Macon, Ga.....	30,000	2,146	180	.....
Oshkosh, Wis.....	30,000	5,920	91	.....
Springfield, Mo.....	30,000	3,680	4	.....
Taunton, Mass.....	30,000	22,000	8	963

* Compiled from *Statistics of Cities*, Bulletin 24, September, 1899, United States Department of Labor. The populations and figures are for January 1, 1899, or the year ending then, as nearly as possible.

PARTRIDGE, General FREDERICK W., former consul-general to Siam, died January 22, 1899, in his seventy-sixth year. He was a resident of Sycamore, Ill. During the Mexican War, when sent on a secret mission by President Polk into the enemy's country, he was captured as a spy, and imprisoned in San Juan d'Ulloa. He entered the Union service in the Civil War as a captain in the Thirteenth Illinois, and was rapidly advanced for bravery. For gallantry at the battle of Missionary Ridge he was brevetted brigadier-general. In 1869 President Grant appointed him consul-general at Bangkok, where he served eight years.

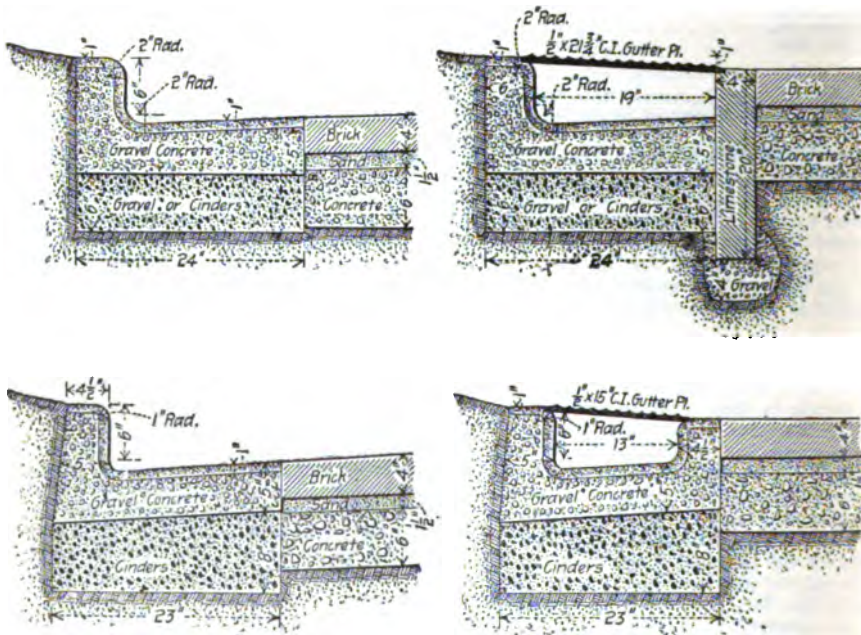
PATENT STATISTICS. One of the causes for the falling off of 24 per cent. in the number of patents applied for at the United States Patent Office in 1898 as compared with the number in 1897, was the Spanish-American war. This cause ceased to operate in 1899. There were received in the fiscal year ending June 30, 1899, 35,352 applications for mechanical patents, 1610 caveats, 2292 applications for designs, 91 applications for reissues, 1861 for trademarks, 612 for labels, and 112 for prints. There were 23,550 patents granted, including reissues and designs, as against 22,267 patents, reissues, and designs in the calendar year 1898. The number of patents that expired was 16,670. The total receipts of the office were \$1,209,554.88; the total expenditures were \$1,148,663.48, and the surplus for the year was \$60,891.40. The surplus for the calendar year 1898 was but \$1538; for the calendar year 1897, \$252,798. The patents granted in the latter year, however, numbered but 23,794, a very little more than for the fiscal year ending June 30, 1899.

An advance of the year 1899 in the work of the Patent Office was the establishment of a classification division, placed in charge of a principal examiner, with the title chief of the classification division. To him is assigned the work of revising and perfecting a classification of all letters patent and printed publications in the patent office which constitute the field of search in the examination as to the novelty of inventions applied for. It is a work of great magnitude, involving the consideration of upward of 620,000 United States patents, and over one million foreign patents, and a large number of technical and scientific publications. It will, however, prove of great usefulness to the department, and the public will receive corresponding benefit.

PATERSON, WILLIAM, jurist, died at Perth Amboy, N. J., January 1, 1899. He was born in 1817; in 1835 was graduated from Princeton, and was admitted to the bar three years later. In 1844 he was made secretary of the convention that framed the present constitution of New Jersey. He was chairman of the Presidential electoral college for his State in 1864, and voted for McClellan. He was appointed judge of the Court of Errors and Appeals in 1882. Judge Paterson was of a well-known New Jersey family; his father was a prominent lawyer in the State, and his grandfather, after serving as State attorney-general, governor, and New Jersey's first United States senator, became a justice of the United States Supreme Court.

PAUNCEFOTE, of Preston, First Baron, Sir JULIAN PAUNCEFOTE, ambassador of Great Britain to the United States, was born in Munich, Germany, September 13, 1828. He was educated in Paris and Geneva, and at Marlborough College, and was called to the bar in the Inner Temple in 1852. In 1865 he became attorney-general of Hong-Kong, and acted there as chief justice of the Supreme Court in 1869 and again in 1872. In 1873 he became chief justice of the Leeward Islands, was knighted by patent in 1874, and in that year was made legal assistant under-secretary of state for the colonies. Two years later he was appointed assistant legal under-secretary of state for foreign affairs, and in 1882 he became permanent under-secretary of state for foreign affairs. In 1885 he was first British delegate to the conference at Paris for drawing up an act relative to navigation of the Suez Canal. In 1888 he succeeded Lord Sackville as British minister to the United States, and in 1893 he was raised to the rank of ambassador. During a visit to England in 1894 Sir Julian was sworn of the Privy Council. He has received several honorary titles. He was one of the most important delegates to the peace conference at The Hague in 1899. In this year he was raised to the peerage.

PAVEMENTS AND ROADS. Progress in street-paving is in the line of improved methods of doing the work, careful selection of material, and constant and intelligent watchfulness on the part of the inspectors, rather than in the adoption of any new material. In America asphalt continues to be the general favorite where it can be afforded, with brick coming next, except where heavy traffic demands granite



SECTIONS OF CONCRETE CURBS AND GUTTERS, CHAMPAIGN, ILL. (From *Engineering News*.)

blocks or some other strong, tough material. In England wood continues in favor, especially the hard woods of Australia. Wood pavements in this country fell in general esteem some years ago, largely because unsuitable woods, with improper or no preservative treatment, were laid on poor foundations, or directly on the earth. It is now recognized that foundations should be prepared with the utmost care, in order to secure good drainage and stability, and that the visible part of the pavement should be considered as a wearing surface only, like plank on a bridge. Foundations are generally of concrete, or a mixture of stone or gravel, sand, and cement. The last named serves as a binding material, to hold the mass together; its selection should be made with the greatest care, and there should be frequent tests of samples from each lot to see that none of it falls below the standard. For this and other features of paving work the most progressive cities now have well-equipped laboratories for conducting chemical and physical tests of paving materials. Such laboratories are also of great value in connection with other branches of municipal work. Asphalt paving materials, in particular, demand the closest inspection in order to see

that the several parts—aspalt, powdered limestone, and sand—are adapted to one another and used in the proper proportions. The contractors for asphalt pavements have to provide quite expensive plants for mixing the ingredients. These may be portable or stationary, according to the amount of work involved and the time it covers. Some of the portable plants are mounted on railway cars, for ready transportation from place to place without being taken down. Three such plants were built during 1899 by the Iroquois Iron Works, of Buffalo, N. Y. The whole plant is concentrated on two flat cars, 45 feet long and 10 feet wide. One car carries the boiler and steam plant for melting the asphalt, and the other carries the sand dryers and storage bin. The asphalt is hoisted by buckets to the melting tanks, in which a heat of 320° Fahr. is maintained. Compressed air under 15 pounds pressure, is blown through the asphalt to keep it stirred up. Compressed air is also used to force the liquid asphalt to a bucket on a weighing scale. The sand is lifted by an elevator, discharged into drums 40 inches in diameter and 18 feet long, where it is heated to 400° Fahr., after which it goes to a rotary screen and thence to a storage bin, and then, as needed, to a measuring box. Finally, all the ingredients go to a steam-jacketed mixer, containing two revolving shafts, set with blades arranged on the screw principle. Here thorough mixing takes place, after which the product is dumped into wagons and hauled to the streets for laying. The maximum capacity of the plant in a ten-hour day is said to be sufficient to cover 1750 square yards to a depth of 2 inches, or 2275 square yards 1½ inches deep, these being common depths for the top coating or wearing surface of sheet asphalt. There are, of course, other styles of portable asphalt-mixing plants, notably the Hetherington type. The first plant of the sort was designed in 1889 by Samuel Whinery, of New York City.

One of the greatest causes of destruction of pavements is the openings in the street for placing pipes, wires, and other underground fixtures. The committee on street paving of the American Society of Municipal Improvements made some sensible recommendations on this subject at the 1899 convention of the society, the importance of which should be impressed on every city official responsible for pavements. The gist of the suggestions is that previous to paving or repaving any street all underground work likely to be needed during the life of the pavement should be put in; and that once paved, no openings of any sort should be allowed, except in emergencies, until a written application, accompanied by an indemnity bond, had been filed by the person or corporation proposing to do the work. At the same meeting, Mr. George W. Tillson, engineer of the department of highways of Brooklyn, New York City, read a paper on *The Life of Pavements*; the life he estimated to be as follows: Granite on concrete, 25 years, and on sand, 20 years; brick, 15 years; wood, 10 to 15 years; asphalt, 18 years.

State aid for road construction was authorized in New York in 1898, and \$50,000 was appropriated for the first year's work. To the close of 1899 contracts had been made for the improvement of 25 miles of highways, of which 13½ miles, on five different roads, had been practically completed and the balance, on six roads, was under construction. Surveys had been made for 142 miles of roads in 14 counties and petitions had been filed for some 300 miles in addition. The State engineer and surveyor, under whose charge this work is done, recommends that a State quarry and crushing plant be established, and Sing Sing convicts employed to produce trap rock for building macadam roads. Under the New York law the cost of road work is paid as follows: 50 per cent. comes from the State funds, 35 per cent. from the county, and 15 per cent. from owners of abutting property. Thus every dollar of money appropriated by the State means two dollars available under the act, since in New York, as elsewhere, petitions accumulate faster than the State funds become available. In New Jersey 85 miles of road were improved under the direction of the commissioner of public roads in 1898, and 115 in 1899, making 440 miles for the period 1893 to 1899, inclusive. The total mileage is distributed throughout 12 of the 21 counties of the State.

PAYNE, CHARLES HENRY, D.D., LL.D., corresponding secretary of the Board of Education of the Methodist Episcopal Church, died at Clifton Springs, N. Y., May 5, 1899. He was born at Taunton, Mass., October 24, 1830; was graduated at Wesleyan University, Middletown, in 1856, and subsequently studied at the Concord (N. H.) Biblical Institute. From 1857 to 1876 he held pastorates at Sandwich, East Bridgewater, and Fall River, Mass., and in Providence, Brooklyn, and Cincinnati. From 1876 to 1888 he was president of Ohio Wesleyan University, Delaware, O. From the latter year to the time of his death he served as corresponding secretary of the Board of Education of the Methodist Church. Dr. Payne had been a member of many important Methodist conferences; he had travelled extensively in western Europe, Greece, Syria, Palestine, and Egypt. He wrote: *Guides and Guards in Character Building*; *Daniel, the Uncompromising Young Man*; *Temperance*; *The Social Glass and Christian Obligation*; *Methodism, Its History and Results*; *Women and Their Work in Methodism*.

PAYNE, SERENO E., member of Congress from the twenty-eighth New York district, was appointed chairman of the committee on ways and means by Speaker T. B. Reed, January 20, 1899, to succeed Nelson Dingley, Jr., deceased January 13. After the Fifty-sixth Congress convened Speaker D. B. Henderson reappointed Mr. Payne chairman of this important committee, December 18, 1899. On January 28, 1899, President McKinley appointed him a member of the Anglo-American Joint High Commission, also to succeed Dingley. Mr. Payne was born at Hamilton, N. Y., June 26, 1843; after graduation at the University of Rochester in 1864 he studied law and was admitted to the bar in 1866; since then he has practised his profession in Auburn. In 1868-71 he was city clerk for Auburn and supervisor in 1871-72; from 1873 to 1879 he served as district attorney of Cayuga County, and from the latter year to 1882 was president of the Auburn board of education. He was elected, as a Republican, to the Forty-eighth Congress and was returned to the Forty-ninth; in 1888 he was elected to the Fifty-first Congress, and has been returned to each Congress since then. In the Fifty-fifth Congress he was chairman of the committee on merchant marine and fisheries.

PEABODY MUSEUM. See ANTHROPOLOGY IN AMERICA.

PELEWS. See CAROLINE ISLANDS.

PEMBERTON, MAX, author and editor, was born in Birmingham, England, June 19, 1863. He graduated at Caius College, Cambridge, and in 1885 joined the staff of *Vanity Fair*; became editor of *Chums* in 1892, and of *Cassell's Magazine* in September, 1896. He has published: *The Diary of a Scoundrel*, 1891; *The Iron Pirate*, 1893; *The Sea Wolves and Jewel Mysteries I Have Known*, 1894; *The Impregnable City and The Little Huguenot*, 1895; *A Puritan's Wife and A Gentleman's Gentleman*, 1896; *Christine of the Hills and Queen of the Jesters*, 1897; *The Garden of Swords and Signors of the Night*, 1899.

PENNSYLVANIA, a Middle State of the United States, has an area of 45,215 square miles. The capital is Harrisburg.

Mineralogy.—In the calendar year 1898, the production of anthracite coal was 53,382,644 short tons, spot value, \$75,414,537; and of bituminous coal, 65,165,133 short tons, spot value, \$43,352,588; in all, 118,547,777 short tons, valued at \$118,767,125. The production showed an increase in the year of 11,518,123 short tons, of which all but about 700,000 tons was the bituminous output. This increase was 8 per cent. of the total increase of the country, and the combined product of both kinds of coal in 1898 was 54 per cent. of the entire output. It is here interesting to note the effect of the increased activity in the iron and steel industries in 1898 on the coal production. The Connellsville region, famous for its great coking interests, is in Fayette and Westmoreland Counties. In the former high-water mark was reached in coal-mining, with an output of 12,696,063 short tons, an increase in a year of nearly 3,000,000 tons; and in the latter the output of 11,414,989 short tons was an increase of about 1,500,000 tons. Allegheny County, the centre of the iron-making district of western Pennsylvania, increased its production 1,673,958 tons; and Cambria County, containing the great Johnstown plant, had an increase of 1,323,511 tons. Fayette County had the largest increase, and Somerset County practically doubled its output of 1897. Anthracite mines numbered 340, and employed 145,504 persons, and bituminous mines, 689, and employed 79,611 persons. The production of iron ore was, red hematite, 13,975 long tons; brown hematite, 142,725; magnetite, 614,818, and carbonate, 1564—in all, 773,082 long tons, valued at \$877,365, a net increase of 49,340 tons. As in iron, the State also produced each of the commercial grades of stone, the output values being: Granite, \$237,780; sandstone, \$478,451; slate, \$2,491,756; marble, \$39,373; and limestone, \$2,746,256—total, \$5,993,616, an increase in a year of over \$500,000. Granite, in decreased output, was used almost wholly for building and road-making; marble, for building and cemetery work; slate, two-thirds of the total production of the country, mainly for roofing; sandstone, increased production, for bridge and building work; and limestone, in which the State held first place, for lime, \$1,201,352, flux, \$965,526, and paving and road-making, \$256,961. Salt declined about 10,000 barrels, with a production of 154,287 barrels, valued at \$46,000.

Manufactures.—During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$23,335,573, the third largest amount among the States. There were 295 manufacturers of tobacco and 6220 of cigars, and the combined production in the calendar year 1898 was 1,321,772,005 cigars, 1,713,300 cigarettes, 100,203 pounds of fine-cut tobacco, 2,996,457 pounds of smoking, and 3,681,671 pounds of snuff. Grain and fruit distilleries in operation numbered 78; the amount of fruit brandy produced was 2624 gallons; spirits rectified, 8,608,606 gallons; distilled spirits gauged, 26,434,831 gallons; and fermented liquors produced, 4,299,006 barrels. The annual report of the Bureau of Industrial Statistics for 1898 (issued in 1899) showed that there were 88 silk plants in operation that year, with a total of 699,308 spindles, 117 hand looms, 9238 power looms, and

3401 machines. The number of persons employed, skilled and unskilled, was: Males, 5441; females, 10,999; and children, 3926—total, 20,366. The output, in round numbers, was 70,000,000 yards of ribbons, valued at \$32,334,620, just about double the production of 1895. Pig-iron production amounted to 5,367,979 gross tons, valued at \$53,331,228, the industry employing 11,911 persons; Bessemer steel, to 3,357,784 gross tons; all steel, to 5,275,984 gross tons; and steel billets and puddle bar, to 5,537,249 net tons, valued at \$136,820,442, the steel industry employing 56,230 persons. There were 18 out of 20 tin-plate works in operation, and the production was 344,064,000 pounds of black plate, or 44 per cent. of the entire production of the country. Of this output, 222,528,000 pounds were tinned. The total production of tin and tin-plate was 261,934,000 pounds. This industry employed 5036 persons. The great advance in the allied iron and steel industries began to develop in 1898, and while the statistics for 1899 are not yet available, the extraordinary conditions of that year are suggested by the facts that in 1898 refined bar-iron was delivered in New York at one cent a pound, and at the close of 1899 it was worth two and a quarter cents a pound, and that when 1899 opened the entire production of pig-iron in the country was about 230,000 tons a week, while at its close the weekly output was 295,000 tons, or the enormous annual amount of 15,000,000 tons. At the close of 1898 there were in the State 151 coking plants, with 27,157 ovens of all kinds, and 292 ovens were building. During the year these plants, together with one in New York, used 16,307,841 short tons of coal, and produced 10,715,302 short tons of coke, valued at \$16,078,505. Pennsylvania led all the States in the production of coke, with West Virginia second and Alabama third. For silk, see article SILK MANUFACTURING.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Philadelphia (\$41,222,528), Erie, and Pittsburg aggregated in value \$42,335,377, and the exports, at Philadelphia (\$60,950,065) and Erie, \$60,952,247, an increase in a year in imports of \$10,259,048, and in exports of \$4,704,120. The movement of gold and silver was, imports, \$21,430; exports, none, making the total foreign trade of the year \$103,309,054, a net increase of \$14,248,420.

Railways.—The new railway construction in the calendar year 1898 was 104.54 miles, and in 1899, 189.65, giving the State a total mileage of 10,128.39, according to the reports adopted in this volume. Local authorities claim a total of 10,308.05 miles.

Banks.—On October 31, 1899, there were 438 national banks in operation and 74 in liquidation. The active capital aggregated \$74,804,020; circulation, \$32,871,906; deposits, \$403,886,435; reserve, \$121,446,230; and resources, \$603,862,234. State banks numbered 90, and had capital, \$9,295,980; deposits, \$67,104,694; resources, \$86,073,732; and surplus and undivided profits, \$8,191,819; loan and trust companies, 88, with capital, \$36,590,215; deposits, \$151,606,689; and resources, \$219,198,571; private banks, 29, with capital, \$1,281,789; deposits, \$7,925,618; and resources, \$9,954,407; and mutual savings banks, 15, with depositors, 334,178; deposits, \$97,404,243; and resources, \$106,702,966. The exchanges at the United States clearing houses at Philadelphia and Pittsburg in the year ending September 30, 1899, aggregated \$5,928,322,323, an increase in a year of \$1,300,608,268.

Education.—In 1897-'98 the enrolment in public schools was 1,173,082; average daily attendance, 864,626. There were 20,080 teachers, 14,666 buildings used as school-houses, and public school property valued at (1896-'97) \$48,917,003. The revenue was \$21,538,153; expenditure, \$19,644,401, of which \$10,332,760 was for teachers' salaries. There were 292 public high schools, with 1022 secondary teachers, 27,082 secondary students, and 2332 elementary pupils; 135 private secondary schools, with 856 teachers, 8618 secondary students, and 8152 elementary pupils; 15 public normal schools, with 359 teachers and 9646 students in all departments, and 6 private ones, with 54 teachers and 1396 students. Thirty-two universities and colleges for men and for both sexes reported 36 fellowships, 412 scholarships, 929 professors and instructors, and 11,396 students, 638,842 volumes in the libraries, valued at \$621,880; \$1,084,198 invested in scientific apparatus, \$12,263,682 in grounds and buildings, and \$9,465,206 in productive funds; \$1,575,680 in total income, and \$658,387 in benefactions. Eleven colleges for women reported 14 fellowships, 34 scholarships, 174 professors and instructors, 1282 students, 59,760 volumes in the libraries, valued at \$91,100; \$62,500 invested in scientific apparatus, \$1,420,000 in grounds and buildings, and \$1,000,000 in productive funds; \$345,594 in total income, and \$21,000 in benefactions. In 1899 there were 1448 periodicals, of which 199 were dailies, 920 weeklies, 240 monthlies, and 12 quarterlies.

Fisheries.—The annual report of the State Fisheries Commission in 1899 showed that 22,000,000 shad were incubated at the Bristol station on the Delaware; 25,000,000 Susquehanna salmon and 1,500,000 blue pike were hatched at the Erie station, and more than 4,000,000 of different kinds at the Corry and Allentown stations. The commission proposes to have the subject of fish culture introduced into the public schools, and for that purpose a large quantity of gold fish is being raised for distribution.

Forest Preserve.—Dr. J. T. Rothrock, the State forestry commissioner, made a tour of the State in 1899, and secured options on several tracts of land aggregating about 100,000 acres, which can be purchased for about \$1 per acre. Governor Stone was anxious to promote the forestry movement, but, in view of the serious depletion of the State treasury, was unwilling to sanction the appropriation of the necessary funds till the treasury reached a better condition.

Finances.—In 1898 the assessed valuations, excluding railway property, were: Real estate, \$2,685,199,712; personal property, \$846,751,853—total, \$3,431,951,565, an increase in a year of \$74,248,788. The total public debt, December 1, 1898, was \$6,815,299; sinking funds, \$5,789,317; net debt, \$1,025,982. The sinking funds held railroad bonds, \$1,100,000; interest thereon, \$22,917; United States consols, \$3,108,000, and cash, \$1,558,400. On March 31, 1899, the State treasurer issued a statement showing a balance in the general fund of \$512,552, the smallest balance in the State treasury since the close of the Civil War. Claims then due and payable aggregated at least four times that amount, and he saw no prospect of accumulating funds by June 5, when the public school appropriation of \$5,000,000 for the fiscal year became due, to pay any part of the appropriation during that month. In October following the State treasury was about \$3,000,000 behind in its payments.

Population.—As estimated by federal officials the population on June 30, 1899, was about 6,115,000.

Legislature.—Few bills of importance were passed during the session which closed April 20. The energies of the legislative body were absorbed in the contest over the election of a United States senator to fill the vacancy which occurred in March on the expiration of the term of M. S. Quay. George A. Jenks and B. F. Jones were the chief candidates opposed to the re-election of Mr. Quay, and during the session the latter was charged with criminal use of State funds for his personal advantage. He was tried by jury, acquitted, and, April 21, was appointed by Governor Stone to temporarily fill the vacant seat in the National Senate. This action of the governor was criticised on the ground of the validity of a senatorial appointment during the session of legislature. The charges of attempted bribery which were alleged against Senator Quay and his adherents were investigated by a committee of nine, with a result that several State officials were implicated. The committee recommended criminal proceedings against them in the Court of Quarter Sessions. A law enacted early in the session provided for the appointment of a committee to confer with other State legislatures concerning the advisability of submitting an amendment to the federal constitution whereby the President, Vice-President, and United States Senators may be elected by direct popular vote, the committee to report to the legislature at its session in 1901. A law was passed providing that all merchants of the State shall pay a flat tax: retail merchants, \$2; wholesale merchants, \$3; and an additional tax of one mill on the dollar on the gross volume of business done by retail merchants during the year, and a tax of one-half mill on the dollar of the business of the wholesale merchants. It was further enacted that existing Pennsylvania corporations may increase their capital stock to any amount, and the incorporation of companies to do all kinds of business was provided for.

Party Platforms.—On August 24 the Republican State convention was held at Harrisburg, and endorsed the national administration. The question of the validity of Governor Stone's appointment of Mr. Quay to the United States Senate again was raised, but the anti-Quay faction was hopelessly in the minority. The following nominations were made for the November elections: For Supreme Court judge, J. Hay Brown, of Lancaster; for Superior Court judge, Josiah R. Adams, of Philadelphia; for State treasurer, Lieutenant-Colonel James E. Barnett. On June 14 the Democratic State convention endorsed the Chicago platform of 1896; condemned the growing expense of administration; charged the Republicans with gross corruption; promised tax and ballot reforms and legislation against the growing power of trusts. On September 7 the Populist State convention adopted a platform declaring "That there are two great domestic questions before the American people: First, the money question, and second, the railroad question, which involves the trust question. And these questions we would solve by the issue of paper money irredeemable in coin and by the nationalization of the railroads." It protested against the war of "criminal aggression" being carried on in the Philippines, and opposed an alliance with Great Britain or any foreign nation. The platform of the party was announced "as standing for a rule of love on earth, not of greed; for liberty, equality, fraternity, and the brotherhood of man."

Elections.—The only State offices to be filled at the November election were those of judges of the Supreme and Superior Courts and State Treasurer. The Republican candidates were all elected, Colonel James E. Barnett, of the Tenth Pennsylvania Volunteers, recently returned from the Philippines, being elected by a plurality of 110,488 votes. In Philadelphia and in Pittsburg the municipal elections were wholly sub-

ordinated to the remarkable political conditions that were disclosed in the protracted deadlock at Harrisburg over the election of a United States senator.

State Officers and National Representatives.—Governor, William A. Stone; lieutenant-governor, J. P. S. Gobin; secretary of the Commonwealth, William W. Grist; treasurer, James E. Barnett; auditor-general, L. G. McCauley; adjutant-general, Thomas J. Stewart; attorney-general, John P. Elkin; Superintendent of public instruction, N. C. Schaeffer; insurance commissioner, Israel W. Durham; commissioner of banking, Thomas J. Powers. Supreme Court: Chief justice, James P. Sterrett; associate justices, Henry Green, J. Hay Brown, James I. Mitchell, J. B. McCollum, John Dean, D. Newlin Fell. The State legislature consists of 164 Republicans, 84 Democrats and 6 Fusionists. Senators: Boies Penrose (Rep.), from Philadelphia; and Matt. S. Quay (Rep.), from Beaver, appointed by the governor to fill the vacancy which the legislature failed to fill. Representatives: G. A. Grow, at large (Rep.), from Glenwood; S. A. Davenport (Rep.), from Erie; H. H. Bingham (Rep.), from Philadelphia; Robert Adams, Jr. (Rep.), from Philadelphia; William McAleer (Dem.), from Philadelphia; James R. Young (Rep.), from Philadelphia; Alfred C. Harmer (Rep.), from Philadelphia; Thomas S. Butler (Rep.), from West Chester; Irving P. Wanger (Rep.), from Norristown; Laird H. Barber (Dem.), from Mauch Chunk; Henry D. Green (Dem.), from Reading; Marriott Brosius (Rep.), from Lancaster; William Connell (Rep.), from Scranton; S. W. Davenport (Dem.), from Plymouth; James W. Ryan (Dem.), from Pottsville; M. E. Olmstead (Rep.), from Harrisburg; Charles F. Wright (Rep.), from Susquehanna; Horace B. Packer (Rep.), from Wellsboro; Rufus K. Polk (Dem.), from Danville; Thaddeus M. Mahon (Rep.), from Chambersburg; Edward D. Ziegler (Dem.), from York; Joseph E. Thropp (Rep.), from Everett; Summers M. Jack (Rep.), from Indiana; John Dalzell (Rep.), from Pittsburg; William H. Graham (Rep.), from Allegheny; Ernest F. Acheson (Rep.), from Washington; Joseph B. Showalter (Rep.), from Chicora; Athelston Gaston (Dem.), from Meadville; Joseph C. Sibley (Dem.), from Franklin; James K. P. Hall (Dem.), from Ridgway.

PENNSYLVANIA, UNIVERSITY OF, at Philadelphia, chartered in 1875, is non-sectarian, and co-educational in the graduate department. Provost, Charles C. Harrison, LL.D. According to the treasurer's report of August 31, 1899, the property of the university, including real estate, libraries, securities, etc., amounted to \$7,538,595; obligations, \$379,764; net balance, \$7,158,831. At the same time the library comprised some 145,000 bound volumes and 100,000 pamphlets. The officers of instruction for the college year 1899-1900 numbered 260. The student enrolment was as follows: The college, 968; department of philosophy, 172; law, 312; medicine, 682; dentistry, 484; veterinary medicine, 46; laboratory of hygiene, 19—total, excluding 10 duplications, 2673. The degrees in course conferred at the commencement of 1899 were as follows: B.A., 20; B.S., 28; B.S.: in architecture, 11; in biology, 4; in chemistry, 11; in chemical engineering, 1; in civil engineering, 5; in economics, 14; in electrical engineering, 14; in mechanical engineering, 7; B.Mus., 1; C.E., 3; M.S., 3; M.A., 4; Ph.D., 10; LL.B., 98; M.D., 211; D.D.S., 158; D.V.M., 12. The following, who were or had been members of the faculty, died during the year: Dr. E. Otis Kendall, professor of mathematics; Dr. Charles Janeway Stillé, formerly professor of the English language and literature, and provost; Dr. Daniel G. Brinton, professor of American archæology and linguistics; Mr. W. H. Carson, formerly lecturer in the law department. See UNIVERSITIES AND COLLEGES; ANTHROPOLOGY IN AMERICA.

PENSIONS. The report of the commissioner of pensions for the year ending June 30, 1899, shows a total enrolment of 991,519 pensions, a decrease of 2195 as contrasted with an increase in the previous year of 17,700. New names to the number of 40,991, of which 37,077 were on original application, were added to the rolls; of the 43,186 names dropped from the pension list, 34,345 were on account of the deaths of pensioners. The report also shows a slight increase during the year in the average annual value of all pensions—namely, from \$131.79 to \$132.74, the rate under the general laws having increased from \$163.21 to \$165.70, and that under the act of 1890 from \$108.11 to \$108.99, while the average annual value of the pensions granted under the war with Spain amounts to \$196.53. The large value of the latter is explained by the fact that only about 300 pensions have been issued on account of the Spanish war, and these exclude pensions for minor disabilities, which have not as yet been considered. Thus, while the roll decreased in numbers during the year, it increased in total annual value \$649,496, owing to increased ratings for increased disabilities. It is expected that the roll will increase not only in amount, but in numbers, for the fiscal year 1899-1900, by reason of the war with Spain. Notwithstanding the increase in annual value, the actual total amount paid out in the fiscal year 1898-99 for army and navy pensions was only \$138,355,053.

which is a decrease from the foregoing fiscal year of \$6,296,826. This decrease is due in part to the assumption in the previous year of payments held over from the year 1897, and the fact that the first payments in 1898 were considerably larger than in 1899. The latter fact was due to the adjudication and disposition of claims of long standing. The total number of pensions, classified by wars and as pensioned under the various laws, is given in the following table:

	1899.	1898.	1897.
Widows of Revolutionary soldiers.....	4	5	7
Daughters of " " " ".....	7	7	9
Survivors of War of 1812.....	1	3	7
Widows " " " ".....	1,998	2,407	2,810
Survivors of Indian wars.....	1,656	2,019	2,373
Widows " " " ".....	3,899	4,067	4,288
Survivors of Mexican War.....	9,904	10,012	10,992
Widows " " " ".....	8,175	8,143	8,072
Service after March 4, 1861:			
General laws—			
Army invalids.....	316,834	327,080	336,299
Army widows.....	90,597	92,545	94,602
Navy invalids.....	4,781	4,833	4,788
Navy widows.....	2,298	2,300	2,373
Army nurses.....	653	655	663
Act June 27, 1890:			
Army invalids.....	405,987	399,366	378,609
Army widows.....	194,187	119,785	110,598
Navy invalids.....	14,925	14,543	13,831
Navy widows.....	6,139	5,944	5,766
War with Spain:			
General laws—			
Army invalids.....	117		
Army widows.....	165		
Navy invalids.....	6		
Navy widows.....	11		
Total.....	991,519	993,714	978,014

Considerable attention was given by the commissioner in the report for 1899 to the question of claims, due in part to the increased business of the bureau, arising from the war with Spain, and to the discussion brought about by pension claim agents and members of the Grand Army of the Republic regarding the justice of certain orders pertaining to the granting of pensions. The total number of claims of all classes pending June 30, 1899, was 477,239, a decrease for the year of 157,820 claims, a very considerable reduction, since the number of cases reported pending includes 17,560 claims arising out of the war with Spain, and no claims of this class were embraced in the number reported as pending June 30, 1898. Of the claims filed on account of the war with Spain, 303 only had been allowed up to the close of the fiscal year, these being claims of widows and invalids, granted by reason of gunshot wounds and for the more severe disabilities.

Of the 477,000 odd pensions of all classes now pending, attention is called by the commissioner to the fact that 305,042 are claims in which pension has heretofore been granted, and in which an additional allowance or an increase of rate is claimed. Delay in the adjudication of claims, the report continues, is in most cases the fault of the claimants or their attorneys. He recommended that a commission be appointed to revise the laws and regulations regarding the filing of claims, and that the law requiring biennial examinations of discharged pensioners be re-enacted.

Considerable attention is given in the report to the reasons by which what is officially known as Order No. 225, which has been objected to by a portion of the Grand Army, was substituted for Order No. 164. Order No. 225 made no change, excepting that it required pensions granted while Order No. 164 was in force to be revised and made to conform to the interpretation of that law as given at the time it was revoked. These "orders" in the Pension Office are based upon semi-official decisions, the final decision resting with the secretary of the interior. Secretary Noble, under the Harrison administration, declared that Order No. 164 had been misconstrued and misapplied, and it was revoked. By its construction a pensioner having two or more separate applications might draw in total an unfair amount of pension, though his injuries in the aggregate might not disable him for the performance of manual labor to a much greater degree than either of them existing alone. This is the point in dispute. The Grand Army committee's position has been that these separate rates for various disabilities should be added together and the applicant given a pension accordingly. In the decision in the case of Henry H. Weeks, January 7, 1893, the state of affairs is given as follows: "Conceding that

\$8 is the correct rate for the disability resulting from rheumatism, the question arises, Is the claimant necessarily entitled to a higher rate because another disability is shown to exist? In other words, where more than one disability is involved, should the rate which would be allowed under the old law for each disability be added to the others to determine the total rate?" The conclusion is, that "in the claim of Mr. Weike, now under consideration, while it is conceded that a disability from another disease exists, which alone would be ratable under the old law, if of service origin, it is not believed that this disease, combined with rheumatism, disables him for manual labor to an extent which entitles him to a higher rating than \$8 per month. Rheumatism is his chief disability. . . . He is evidently able to perform considerable manual labor."

During the year 1899 an active campaign was instituted against attorneys illegally registered upon the roster, with the result that 24,662 were disqualified, of whom 1163 were debarred or suspended and 2961 disqualified by other causes. There were on the records of the Pension Bureau when the present commissioner came into office the names of over 50,000 attorneys or claim agents. This number has been reduced to 18,491 attorneys entitled to recognition. The amount paid to these agents last year was \$476,961 as compared with \$702,000 the preceding year.

The following figures are for the last two fiscal years ending July 1, the totals being for the years from 1866 to 1899 inclusive:

FISCAL YEAR.	DISBURSEMENTS FOR PENSIONS.		FEES OF EXAMINING SURGEONS.	
	Army.	Navy.	Army.	Navy.
1898.....	\$140,324,348.71	\$3,727,531.09	\$904,249.08	*
1899.....	134,671,258.68	3,683,794.27	715,191.28	*
Total, 1866-99.....	\$3,338,559,870.58	\$51,351,104.16	\$15,181,708.12	\$309,278.11

FISCAL YEAR.	Cost of Disbursement, Pension Agencies, etc.	PENSION BUREAU.		Number of Pensioners on Rolls.
		Salaries.	Other Expenses.	
1898.....	\$536,639.84	\$2,354,181.40	\$429,081.14	993,714
1899.....	524,496.49	2,151,578.85	465,805.63	991,519
Total, 1866-99.....	\$12,092,178.63	\$44,442,110.75	\$7,795,115.67	.

* Now included in army.

PENYOINK EXPERIMENTS. See BIOLOGY (paragraph Hybridization).

PENZANCE, Baron, JAMES PLAISTED WILDE, British jurist, died December 11, 1899. Born in London, July 12, 1816, and educated at Winchester and at Trinity College, Cambridge, he became a barrister in the Inner Temple in 1839 and a Queen's counsel in 1855. From 1860 to 1863 he was a baron of the exchequer, and from the latter year to 1872 judge of the Court of Probate and Divorce. He became in 1875 judge of the provincial courts of Canterbury and York, and held the position until he died. He was the first Baron Penzance, created in 1869, and left no heir.

PEOPLE'S CHORAL UNION, an association of singers, organized in 1894 in New York City, with Frank Damrosch as director, had in 1899 a membership of 1667. Secretary, John McDonough, 47 Morton Street, New York City.

PEROSI, LORENZO, composer and Roman Catholic priest, was born December 20, 1872, at Tortona, in Piedmont. He took holy orders, but also studied music at the Milan Conservatory in 1892-93, and in 1894 was under Franz Xaver Haberl at Ratisbon. He then became director of music in a church at Imola, but soon was called to the position of vice-director at St. Mark's, Venice. Perosi's oratorio trilogy, *The Passion, The Transfiguration of Christ, and The Resurrection of Lazarus*, made such a sensation in Italy that at the end of 1898 he was given the position of music director at the Sistine Chapel in the Vatican. The first performance of a new oratorio, the *Resurrection of Christ*, was given at Paris under the composer's personal direction about March 20, 1899. The first performance in America of *The Resurrection of Lazarus* was given in the Metropolitan Opera House, New York, April 16, 1899. Perosi's work has not aroused in Germany so much enthusiasm as in Italy; in any event, however, and especially when his age is considered, he is regarded as a remarkable composer. His compositions, besides those mentioned

above, include twenty-five masses, an Easter oratorio, a requiem for male voices with organ accompaniment, psalms, etc.

PERSIA, called by the natives Iran, is an Asiatic monarchy lying between the Turkish possessions on the west and Afghanistan and Baluchistan on the east, and between Russian territory and the Caspian Sea on the north and the Persian Gulf and the Arabian Sea on the south. The capital is Teheran.

Area, Population, etc.—The country extends some 900 miles from east to west, and 700 miles from north to south, the total area being about 628,000 square miles. A large part of this is desert. The number of inhabitants is about 9,000,000, and a large proportion of the rural population consists of nomadic tribes of Turks, Arabs, Kurds, Lurs, etc. The approximate populations of the chief cities are: Teheran, 210,000; Tabriz, 180,000; Ispahan, 80,000; Meshed, 60,000; Barfurush, 50,000; Yazd and Kerman, each upward of 40,000. The great mass of the population belongs to the Shiah sect of the Mohammedans; there are about 800,000 Lunnis, 45,000 Armenians, 25,000 Jews, and 25,000 Nestorians. The resident Europeans are said not to exceed 800. Instruction is carried on by means of private tutors, primary schools, and a large number of higher schools, receiving public support, where Persian and Arabic literature, religion, and some science are taught. The greater part of the people, however, who receive any instruction at all, learn only to read the Koran.

Government.—Persia is regarded as an absolute monarchy, the Shah being entirely autocratic so far as his rulings do not conflict with the precepts of the Koran. For the last few years the Shah has to some extent exercised his power through a responsible ministry. Persia is divided into thirty-three provinces, administered by governors-general, who are responsible to the Shah. Justice, which is said to be always summary, is administered by these governors and their representatives, by the priests, and by the Sheikhs-el-Islam. The standing army does not comprise more than 24,500 men; the entire army (only one-half of which is liable to service) is reported to number 105,500. The so-called navy comprises only one small steamship and a still smaller river steamer.

Finance.—The chief sources of revenue are ports and mines, fisheries, and various other concessions; about 15 per cent. is derived from customs. The largest items of expenditure are for the army and pensions. The estimated revenue for the fiscal year 1899 was £1,500,000 (\$7,299,000); the estimated expenditure for 1898 was 50,100,000 krans. On October 1, 1899, the kran was valued at \$0.08 in United States currency, so that the above amount represents \$4,008,000. The whole revenue is at the disposal of the Shah, whose private fortune is said to amount to a sum between \$19,000,000 and \$24,000,000. A large part of this treasure is in precious stones.

Industry, Commerce, etc.—The leading agricultural products are wheat, barley, rice, gums, fruits, cotton, sugar, opium, tobacco. Opium culture is increasing, the export amounting to over \$3,640,000. The mineral wealth is by no means small, though at present undeveloped; among the minerals found are salt, iron, coal, copper, lead, sulphur, antimony; there are also found turquoises and some other precious stones. Among manufactures silk is the most important, the annual production of which is about 606,000 pounds, of which about two-thirds are exported. The annual export of wool is about 7,714,000 pounds; cotton, 9,934,000 pounds; tobacco, 5500 tons. The yearly export of hand-made carpets amounts to more than \$680,000. Persian fabrics are noted for their excellence of dye. The leading imports are cotton and woollen goods, sugar, petroleum, tea, coffee, drugs, hardware, glass. Trade is chiefly with Great Britain, though in the northern part of the country Russian merchants are in the ascendancy. In 1898 the direct trade with Great Britain was: Imports to Persia, £338,017; exports from Persia, £193,291. In December, 1899, it was reported that the high price of bread had caused much distress in Persia and that famine was threatening the poorer classes.

The only railway in operation is from Teheran to Shah Abdul-azim, a distance of only six miles. Methods of transportation are primitive, carrying being done principally by pack-mules and camels. (See **AFGHANISTAN**.) The only two wagon roads in the country are from Teheran to Korn and Teheran to Kazvin, each about 90 miles in length. There are about 4150 miles of telegraph line and 95 stations. The post-offices number less than 90.

PERU, a republic of South America, is bounded on the north by Ecuador and Colombia, on the east by Brazil and Bolivia, on the south by Chile and the Pacific Ocean, and on the west by the Pacific Ocean. The capital is Lima.

Area and Population.—The country comprises eighteen departments and two littoral provinces, the total estimated area of which is 463,747 square miles. The last census was taken in 1876, when the population was reported to number 2,621,844, exclusive of about 350,000 uncivilized Indians. The population at present is estimated at 3,000,000, and is said to be nearly stationary on account of the high rate of infant mortality among the lower classes, and alcoholism and small-pox among the Indians.

Another estimate, however, published in the spring of 1899, places the number of inhabitants between 3,700,000 and 4,000,000; the following figures also are given for the population of the principal cities: Lima, 113,000; Callao, 48,000 Arequipa, 35,000; Cuzco, 30,000; Catacaos, 25,000; Ayachuco, 20,000; Cincha, 18,000. Though their number is unknown, it is estimated that the aboriginal Peruvians (Indians) constitute more than one-half of the population, that nearly one-quarter are mestizos, and that about one-fifth are of Spanish blood. The final disposition of the provinces of Tacna and Arica, now held conditionally by Chile, had not been made at the close of 1899.

Government.—By the constitution, dating from 1856, with a revision in 1860, and based on that of the United States, the executive authority is vested in a president, who is chosen by popular vote for a term of four years, and is assisted by a ministry of six members, holding office during his pleasure and representing the departments of the interior, foreign affairs, finance, public works, war and marine, and justice. The president is Señor Eduardo Lopez de Romaña, who, in May, 1899, was elected to succeed Señor Nicolás de Piérola, and was inaugurated on September 8. Under him the new president of the council and minister of foreign affairs is Señor Manuel María Galvez. The legislative power devolves upon a congress of two houses, the senate and the house of representatives. Senators are deputies of the provinces, there being one senator for each 30,000 inhabitants or fraction thereof over 15,000; representatives are chosen by electoral colleges of the provinces, there being two representatives from each department containing two provinces, and one more representative for each additional two provinces in a department. The departments are subdivided into 95 provinces, and these into 779 districts; the two littoral provinces and the departments are governed by prefects, the provinces by sub-prefects, and the districts by governors.

Army and Navy.—The peace footing of the regular army numbers 3157 officers and men, comprising infantry, cavalry, and artillery. A reorganization of the army has been undertaken for the government by a number of French officers. There is a military school at Chorillos, near Lima. The navy consists of twelve vessels; ten of these are very small and of little value, one is a screw steamer, and one a cruiser of 1700 tons.

Finance.—Customs duties constitute the chief item of revenue; others are taxes, the salt monopoly, and posts and telegraphs. The largest expenditures in 1898 were for the departments of war and marine, finance, and the interior. The estimated revenue and expenditure in soles for 1897 were 10,721,520 and 11,308,240 respectively; for 1898, 10,785,850 and 11,488,240 respectively; of the revenue for the latter year, according to estimate, 6,320,000 soles were derived from customs. The estimated revenue for the fiscal year 1899 was stated to be \$5,767,495 in United States currency. Stamp revenues and taxes on opium, tobacco, and alcohol were farmed out in 1896 for two years, at the expiration of which time the contract was renewed for five years, with an increased advantage to the government. In 1890 Peru was released from her foreign debt, contracted in England, amounting to £31,579,080 and £22,998,651 arrears, by a cession to the bondholders for a term of sixty-six years of all the federal railways, mines, lands, and guano deposits. Since 1896 the salt industry has been a government monopoly, the proceeds of which are placed in fund for the redemption from Chile of the provinces of Tacna and Arica. The total internal debt in 1898 was estimated at 47,591,760 soles. An attempt is being made to establish a gold currency. In April, 1897, the coinage of silver was suspended, and the importation of silver specie prohibited. Much silver coin has been melted down to be exchanged for gold. Since December, 1897, customs duties have been leviable in pounds sterling, though they may be paid in silver at the rate of 10 soles to the pound; the 10 soles, however, fall somewhat short in value of the English pound, and consequently the government exacts a surcharge of 5 per cent. Besides the International Bank of Peru, there are three commercial banks. The value of the sol in United States currency on October 1, 1899, was \$0.436. The New York *Journal of Finance* announced in September, 1899, that Peru had changed the monetary unit from the sol to the libra, the value of the latter being equal to the English pound sterling. This alteration was caused by the recent measures for substituting the gold standard for the silver standard of currency in the republic, and by the fact that the bulk of Peruvian trade is with Great Britain.

Industries.—Agriculture and mining are the principal industries; manufactures have not yet become important. The chief crops are cotton, coffee, and sugar, while other products of importance are tobacco, cocoa, rice, potatoes, cereals, wines and spirits, dyewoods, medicinal plants, alpaca, and fruits. Coffee is produced chiefly in central Peru, in the districts of Paucatambo, Perené, and Chanchamayo, where the Peruvian Corporation has concessions amounting to 5,000,000 acres. The industry, however, like other agricultural industries and mining in Peru, is seriously impeded by difficulties of transportation; also the number of laborers is insufficient. It was

reported that the coffee exports for 1897 amounted to 1239 tons; the amount forwarded from the Perené and Chanchamayo districts to Lima in 1898 was about 1350 tons. The transportation difficulties and the depreciation of coffee have discouraged producers. About 187,000 acres, chiefly in the coast region, are given to sugar cultivation. The output for 1897 is stated to be 105,000 tons. The mineral wealth of Peru is exceedingly great; among the minerals taken out are gold, silver, copper, mercury, zinc, lead, sulphur, salt, coal, and petroleum. In 1897 the number of mining claims recorded was 3475, but many were unworked. About one-half of the mining companies are controlled by Peruvians. Coal of excellent quality has been found on both the east and west sides of the Andes, but its exploitation has not hitherto been profitable. The silver output for 1896 was estimated at 3,300,000 ounces; the value of the output in 1897, including bar silver and silver sulphides and ores, was put at 9,730,000 soles, and the value of the total mineral production at 11,000,000 soles. At Cerro de Pasco, long famous for its silver mines, copper mining was carried on extensively in 1898 and 1899. During the year ending June 30, 1899, there were exported from Cerro de Pasco and Yauli about 17,000 tons of copper ore and mattes, the value of which, exclusive of the silver and gold contained therein, was placed at £306,000. It is estimated that the deposits at Cerro de Pasco contain 15,000,000 tons of copper ore, representing at least 3,000,000 tons of metallic copper.

Commerce and Shipping.—The principal exports are sugar, silver, copper, cotton, coffee, wool (sheep and alpaca), rubber, cocaine, and cacao leaves; the chief imports are cotton and woollen textiles, iron, and machinery. This commerce is carried on mainly through the ports of Callao, Mollendo, Chimbote, Salaverry, Paita, Eten, Trujillo, and Pisco. In 1897 the imports and exports in soles amounted to 18,004,048 and 31,025,381 respectively; for 1898 the reported amounts were: Imports, 19,207,300 soles; exports, 30,274,800 soles. The countries leading in imports in the latter year were: Great Britain, 8,632,800 soles; Germany, 3,401,900; United States, 2,078,400; France, 1,554,000; Chile, 1,368,500. The principal countries receiving the exports were: Great Britain, 17,153,900 soles; Chile, 4,588,500; United States, 2,873,500; Germany, 2,703,800. In 1898 there were exported 103,718 metric tons of sugar, 6712 of cotton, and 4295 of rice. Trade with the United States at present is very small, but is said to be increasing. In 1898 the sugar export was to a considerable extent diverted to this country from England. In 1897 the coca leaves exported amounted to 493,677 kilos, and crude cocaine 5207 kilos. In the latter half of 1899 disturbances in the interior of Peru prevented the gatherers of coca from making shipments to Lima, and in consequence the price of raw cocaine in the United States increased more than 100 per cent.

In 1896 the merchant marine comprised 132 vessels, aggregating 11,199 tons; of this tonnage 9953 tons were carried by 36 vessels. In 1897 there entered at Callao 492 vessels, of over 50 tons, with a total tonnage of 600,049, and cleared 503 vessels, aggregating 618,677 tons. Vessels under 50 tons numbered 889, and had a total tonnage of 10,966. In 1896 the entering tonnage at Trujillo was 446,520.

Communications.—The roads of Peru are in wretched condition; they are usually simply bridle paths. Difficulties of transportation, not only in Peru, but in other South American countries, are among the chief obstacles to industrial and commercial progress. There is under construction a road from La Merced in Chanchamayo to Puerto Bermudez on the Pichis River, establishing communication with the Amazon; this undertaking has not yet achieved great success, though much money has been expended for it. In the fall of 1899, however, it was reported that 145 of the total 175 kilometres of the road were completed. "With the completion of the Pichis road the journey between the two oceans will be made in the following manner: From Callao to Oroya, by rail, 220 kilometres; from Oroya to Puerto Bermudez, on horseback, about 300 kilometres; from Puerto Bermudez to Iquitos, by steamer, approximately 1500 kilometres; and from Iquitos to the mouth of the Amazon, 3500 kilometres; a total of 5520 kilometres" (3430 miles). A carriage road has been projected from the railway terminal Sicuani to Cuzco, 90 miles distant, and in June, 1899, was reported to be completed as far as Urcos; this road will pass through the provinces of Canchis, Quispicanchis, and Cuzco. In 1895 there were 924 miles of railway, of which 800 miles belong to the state; the state railways constitute a part of the property mortgaged in 1890 to the Peruvian Corporation, which is chiefly controlled by English capital, for sixty-six years. The cost of these railways, private and state, and including those ceded to Chile, is about \$175,000,000 (gold). In the summer of 1899 it was announced that a contract had been signed with the government for the construction of a railway, 66 miles in length, from Oroya, the present railway terminal, to Cerro de Pasco. The road is to be completed in 1903. It will connect with Callao the great mineral region around Cerro de Pasco, and will doubtless give a great impetus to the mining industry, augmenting especially the output of copper and silver.

Telegraph lines at the beginning of 1899 aggregated 1928 miles, of which about

1400 miles belonged to the state; there are 48 telegraph offices. The submarine telegraph cables touch at Callao, Mollendo, and Paita, and there is a station at Lima. Telephone lines aggregate 2300 miles. The postal department is self-supporting, and yields a small revenue besides; there are 320 offices. It was announced in the summer of 1899 that a steam launch for carrying the mails had begun to make fairly regular trips between Puerto Bermudez on the Pichis River and Iquitos on the Amazon.

Religion and Education.—The constitution guarantees political but not religious freedom; the state church is Roman Catholic, and the public exercise of other faiths is prohibited; the law, however, is not strictly enforced, as there are Anglican churches and schools in Lima and Callao. Moreover, in the spring of 1899 a publication of the Peruvian government announced that to foreigners "the most ample and complete liberty of conscience is guaranteed, without any further obligation than that of respecting the state religion." It was also stated that the children of foreigners may receive public instruction on the same basis as Peruvian children. An act of December 23, 1897, established the validity of civil marriages of non-Catholics or of a Catholic and a non-Catholic, and also marriages solemnized by ministers of dissenting churches; such marriages must be registered, and those of a date previous to the passage of the act will be deemed legal if registered before the end of 1899. On May 9, 1899, a supreme presidential decree was promulgated, supplementary to the law of 1897, and relative to the method of establishing proper proof in the case of civil marriages.

Primary education is nominally obligatory and in the municipal schools gratuitous. In the departmental capitals the government maintains high schools. The old University of San Marcos, having schools of science, law, medicine, theology, and economics, is situated at Lima, in which city also is a school of mines and civil engineering. There are two universities of lesser importance at Cuzco and Arequipa. On September 3, 1899, the corner-stone of a new school of medicine, to be erected by the government at an estimated cost of 203,297 soles, was laid in the Botanical Garden at Lima by President Piérola.

A New President.—The administration of President Nicolas de Piérola, which came to an end in the summer of 1899, brought to Peru quiet and comparative prosperity. Previous to the last election, in May, a friend of Señor Manuel María de Romaña, a candidate for the presidency, instigated an ineffectual revolt for the purpose of furthering the interests of Romaña. The attempt, however, was ill-advised, and Romaña was quietly elected with little opposition. On the 14th of August he was officially proclaimed president, and on September 8 was inaugurated.

Rebellion.—In the fall of 1899 a revolutionary movement of considerable strength developed, which, after an attack on the custom house at Pisco, culminated in a battle that was announced to the authorities at Lima on November 5. The conflict took place at Huanuco, capital of the department of that name, about 180 miles northeast of Lima, and resulted in the complete defeat and rout of the insurgents, who were led by General Durand. Besides a large quantity of arms and ammunition and many horses, the insurgents lost many men in killed, wounded, and prisoners. Though General Durand and his brothers effected their escape, the defeat was regarded as a death blow to the revolt.

Cabinet Crisis.—A ministerial crisis came in the latter part of November, and on the 2d of the following month the cabinet resigned. A new cabinet was announced on December 15, with Dr. Rivaguero as president of the council and minister of foreign affairs and Dr. Belaunde as minister of finance.

PESNELLE, Very Reverend EUGENE, superior-general of the Roman Catholic order of the Fathers of Mercy, died in Paris, July 6, 1899, at the age of seventy-five years. He was born in Bordeaux, France, and became a professor of law and theology at the seminary in that city. He was elected superior-general of his order in 1893.

PETERS, J. B., sometime chief justice of Kentucky, died at his home in Mount Sterling, Ky., September 18, 1899, in his ninety-second year. For many years he was a member of the Kentucky Court of Appeals, and for sixteen years was chief justice. He was a schoolmate of Jefferson Davis at Transylvania, and was an intimate friend of John C. Breckinridge and other famous Kentuckians of a past generation.

PETROGRAPHY. The higher part of the central and nearly the entire width of the southern Sierra Nevada Mountains in California are found to consist of a mass of granular rocks, in part gneisses, which are the oldest of the series, but largely of granular igneous rocks, among which are granites, grano-diorites, gabbros, peridotites, pyroxenites, etc. The term *granolite* has been suggested by Pirsson for all igneous rocks of granitic or holocrystalline texture. Merrill considers that the term weathering should be restricted to those superficial changes in a rock mass brought

about by atmospheric agencies, and resulting in the more or less complete destruction of the rock as a geological body. It has been proposed to establish an international journal of petrology, in order to have one source to which one can turn for up-to-date and reliable information on the subject. A paper on the petrographical province of Essex County, by Washington, discusses the chemical and genetic relationships of a classic area in eastern Massachusetts. Smith finds that the rocks of Mt. Rainier are basalts and andesitic lava and tuffs, that pass into each other by insensible gradations, while Hague notes that the lavas of the early tertiary volcanoes of the Absaroka range on the east of the Yellowstone Park are a repeated succession of hornblendic and micaceous andesites, basalts, and pyroxene andesites, and finally a series of basaltic flows, while with these are associated a great series of tuffs and igneous conglomerates. A. Harker gives the average composition of the British igneous rocks from 397 analyses, and compares them with the average of 680 analyses of American igneous rocks. In most instances there is a striking similarity. J. A. L. Henderson has published petrographical and geological investigations of certain Transvaal norites, gabbros, and pyroxenites. A translation of Lewinson-Lewssing's classification of rocks and differentiation of magmas is given in the *American Geologist* for June, 1899.

Books.—*Die Eruptivgesteine des Kristianiagebietes, III.*, W. C. Brogger; *Recherches Géologiques et Pétrographiques sur le Massif du Mont Blanc*, Louis Départ and L. Murazet. See GEOLOGY.

PETROLEUM. Corrected returns for 1898 give the production as 55,364,233 barrels, valued at \$44,193,359. No new fields of importance have been discovered, but several new wells of large capacity have helped to increase the production. The petroleum industry has been aided by the prevalence of good prices. There have also been increased exports of crude oil, naphthas, illuminating oil, and paraffine, in the face of keen competition with Russia and other foreign countries, especially those of the Far East. There has, however, been a falling off in the export of residuums, such as tar. The Appalachian field, which includes New York, West Virginia, Ohio, and Pennsylvania, continues to be the leading producer, and the price per barrel for petroleum for this year was from \$1.36 to \$1.60. It is stated that in this region 7026 new wells were completed in 1899. In certain parts of the United States much attention is being given to the use of petroleum for fuel in locomotives, and the results indicate success. A composite paper on the origin and chemical composition of petroleum by Sadtler, Peckham, Day, Phillips, and Mabery gives a valuable summary of our knowledge of petroleum and natural gas, and incidentally of all the native bitumens. Dr. Day, for instance, develops a suggestion as to the origin of Pennsylvania petroleum, in which he considers that the oils have been derived by distillation from the underlying silurian strata. Among other things, Professor Mabery shows the difficulty which exists in correlating the composition or specific gravity with the distribution or geological occurrence, and points out that even the high sulphur oils, which some have regarded as characteristic of limestones, may also be typically developed in sandstones and shales.

PHI BETA KAPPA, a Greek-letter society, chapters of which are found in 50 American colleges, organized in 1776, had in 1899 an active membership of 12,385. The next triennial meeting is to be held in 1901. The government of the chapters is directed by the national council, consisting of 11 senators and delegates from the various chapters. Officers of the national council: President, Hon. J. A. De Remer, LL.D., Schenectady, N. Y.; secretary and treasurer, Rev. E. B. Parsons, D.D., Williamstown, Mass.

PHILADELPHIA EXPOSITION. See NATIONAL EXPORT EXPOSITION.

PHILHARMONIC SOCIETY, New York, was founded in 1842 and incorporated in 1853. On the death of Anton Seidl in 1898, Emil Paur, formerly conductor of the Boston Symphony Orchestra, was appointed musical director. Among the soloists in 1899 were the violinist Petschnikoff and the pianist Mark Hambourg. There were over 100 performers in the orchestra. President, E. Francis Hyde; secretary, August Roebbelen.

PHILIPPINES, a group of islands acquired by the United States from Spain in 1898, lie in the Pacific Ocean between 4° 45' and 21° north latitude, and in longitude between 118° and 127° east from Greenwich. The number of islands has been estimated from 1200 to 1800, the greater number being small and of no value.

Area and Population.—The total population is estimated at about 8,000,000; the islands of chief importance and where 90 per cent. of the Christian population may be found are the first six of the following, the area and Christian population of each being given:



Islands.	Area.	Population.	Per. sq. m.
Luzon	44,400	3,426,000	79
Panay	4,700	735,000	155
Cebu	2,400	504,000	210
Leyte	3,800	270,000	71
Bohol	1,300	245,000	188
Negros	3,300	242,000	73
Mindanao	34,000	209,000	6
Samar	4,800	186,000	38
Mondoro	4,000	67,000	17
Romblon	600	35,000	58
Nasbate	1,400	21,000	15
Total	104,600	5,940,000	57

Other smaller islands increase the area to about 140,000 square miles, and 6,000,000 population, or 43 to the square mile. Mountain ranges in all the islands make a great part uninhabitable, so that in several places the density of population is greater than that of any of the United States, except Massachusetts and Rhode Island. To the Christian population should be added the following estimates of non-Christian population:

Chinese	75,000
Moors or Mohammedans in Paragan and Jolo	100,000
Moors or Mohammedans in Mindanao and Basalan	209,000
Heathens in the Philippines	830,000
Heathens in the Carolines and Palaos	50,000

Total 1,264,000

There are at least thirty different races, each speaking a different dialect, but about 82 per cent. of the Christians are either Tagals or Visayas. The Tagals of Manila are short and of a coppery-brown color, and are said to be industrious. The greater part of the population is engaged in agriculture. The half-breeds, or persons with a mixture of Spanish and native blood, are called mestizos, and are a comparatively small number, found in the vicinity of Manila. Some of the natives have become prosperous lawyers, doctors, priests, and merchants. There are said to be about 4500 books published in the native language.

Climate.—The thermometer during the year ranges from 61° to 97°, though in July and August it rarely goes below 79° or above 85°. Three seasons are well marked: (1) The temperate and dry, from November to February; (2) hot and dry, from March to May, and (3) temperate and wet, from June to October. The rains are constant and very heavy in July and August. The total annual rainfall has been known to be as great as 114 inches, which is greater than the average annual rainfall at Hong Kong. A report upon the expedition sent in 1899 by the Johns Hopkins University to investigate the prevalent diseases in the Philippines, shows that skin diseases, including smallpox, are prevalent among the natives, as well as leprosy, tuberculosis, venereal diseases, and beri-beri. "The chief causes of disability among the American land forces are the enteric diseases. These are diarrhœa, dysentery, typhoid-fever, and gastro-intestinal catarrhs. Other infectious fevers are relatively infrequent. A small number of cases of scarlet-fever and diphtheria only were encountered. The malarial fevers prevailed, but not seriously, during the months of May, June, and July. Dysentery is responsible for the greatest amount of invalidation and the highest mortality. . . . In the worst season of the year the climate is very trying, and especial precautions are to be taken if Americans are to keep well there. The extremes of temperature are not great, but the constancy of the high temperature, together with a high degree of humidity, make the climate peculiarly enervating."

The tropical fruits are supplemented by many products of the temperate zone, such as potatoes, barley, and wheat. The chief exports are, however, sugar, hemp, tobacco, and coffee, together with indigo, sapan-wood, and copra. Rice and maize are grown, but are not exported. The finest tobacco grown in the islands comes from the northern part of Luzon. Hemp is the best known product of the Philippines, the name Manila having been given to various products made of it, such as rope, paper, etc. A writer, Max L. Tornow, says of it in the *National Geographic Magazine* (February, 1899): "It is remarkable that, although there are the most various species of the *musa* flourishing in warm climates generally, the *musa textilis* (hemp-tree) appears to thrive to the best advantage only in the Philippines. Attempts to grow the plant in other places have been uniformly unsuccessful. Like its better-known relative, the edible banana (*musa paradisiaca*), the stem of the plant is formed by the leaf stalks, in the centre of which again is the blossom-stem. The finest growth is obtained in the volcanic and rainy districts of the

Philippines, particularly in Camarines Sur, Albay, Samar, Leite, Marinduque, Cebu, and in some of the small neighboring islands, as well as in Negros and Mindanao. The valuable hemp-fibre is found in the petioles, from which it is taken before the plant has borne fruit, as otherwise the fibre loses in elasticity and lustre. In two or three years the plant has usually attained such growth that it can be cut down, the leaves removed, the green epidermis stripped from the stem, and either the bast-strips torn off lengthwise or the petioles separated singly, and the inner membrane, with the pulpy portion of the plant, removed. The bast-strips thus obtained are drawn under a knife in order to scrape away any pulp that may have remained on them. The product, after having been dried in the sun, is then ready for shipment. This process, though simple, involves a great loss of fibre, which might be avoided by the use of more efficient stripping machines. It is difficult to accustom the natives to anything novel, but when once progress has gained a general footing, headway will be made in particular paths also. Manila hemp has so far been equalled by none, much less excelled." The number of bales of hemp exported to the United States in 1897 was 417,473, or 50 per cent. of the total output. The United Kingdom received in that year 385,182 bales, and the continent of Europe, 22,373 bales, the total number of bales exported being 825,028.

There is a large quantity of timber found in the archipelago. The mineral wealth of the islands, consisting of coal, iron, lead, sulphur, copper, gold, and petroleum, is considered to be great, but is comparatively undeveloped. It is believed that coal is to be found in all the islands. First discovered in Cebu in 1827, it has since been found in Negros, Mindanao, Luzon, Camarines, and Albay. The coal of Cebu is said to be of the finest quality, comparing well after many experiments with the best Newcastle coal. So great have been the hindrances to the successful mining and exploitation of this product that a large quantity of coal is imported from Australia and Japan. The best iron is found in Luzon, where the ore has 75 to 80 per cent. pure iron. Copper of the best quality is found in the district of Lepanto, on Luzon, mines having been worked for a time, but abandoned about 1875 through lack of workmen. Gold occurs in many places on the islands, but it has not yet been made a profitable industry, a small quantity only having been washed by the natives from the river deposits. Sulphur is found in Albay, but the beds have not been worked for 20 years.

Other important products of the Philippine Islands other than those already mentioned are rice, corn, cocoanuts, and cacao. Coffee and cotton, though formerly produced in large quantities, have of recent years declined, the former having been almost exterminated by insects, and the latter driven out by the competition of cotton goods imported from England. Rice produced on the islands is not sufficient for home consumption, and a large amount is imported from Saigon, Hong-Kong, and Singapore. Sugar-cane is raised in the Visayas, and there are 2 large refineries in Manila. In 1897 sugar was exported from the Philippines to the amount of 153,576,125 pounds, of which 43,261,182 pounds (over 28 per cent.) went to the United States, 106,578,638 pounds went to the United Kingdom, and 3,736,305 pounds to the continent of Europe. The export to the United States has greatly declined, having been 284,654,552 pounds in 1889 and 174,066,872 pounds in 1896.

Of domestic animals, cattle, goats, and sheep, introduced from Spain, are of comparatively little importance, but swine and chickens are plentiful. The carabao, or black water-buffalo, is largely used as a beast of burden and for ploughing in the rice-fields. A kind of small horse, very tough and of great endurance, is also used.

Religion and Education.—The religion of the majority of the population is the Roman Catholic, introduced by the Spaniards. (For figures see paragraph Area and Population.)

The great diversity of dialect in these islands, there being about 30 different dialects spoken on the several islands, is partially exhibited by the following table from the latest report of the commissioner of education in Washington:

Dialect.	Number who speak it.
Visaya.....	2,094,409
Tagalo.....	1,216,508
Cebuano.....	888,886
Ilocano.....	854,378
Vical (Bicol).....	812,554
Pangasinan.....	268,000
Pampango.....	188,494
Total.....	4,750,139



1



2

SCENES IN THE PHILIPPINES.—1. The Puerta de Isabel II., one of the gates of the old way between Manila and Malolos. 3. Warfare in the Philippines and the Pasig River, with the old stone bridge



3



4

d City of Manila. 2. An Insurgent barricade, with an old Spanish gun, on the rail-
nerican artillery in the trenches outside of Manila. 4. Manila
onnecting the walled city with Binondo.

The school system of the Philippines was organized by the Catholic missionaries; and as early as 1858 the University of the Philippines had an attendance of about 1000. At the time of the conquest of the islands by Spain the Visayas and Tagals had a written language, though there was nothing that could be called a literature. They are considered by some authorities to be more capable of education than the natives of Central or South America. The other tribes are of a lower intellectual order. "Two-thirds of the Tagals can read and about half of them can write. They are a cheerful, peaceable people, are disposed to enjoyment, and have an eye rather to pleasures and things that are beautiful and attractive than to the useful and profitable, in which they are totally unlike their Chinese neighbors. They work enough to supply their needs—an easy task, because of the superabundance of rice and fish—and are willing to work just a little more to provide brilliant colored clothes, festivities, etc. Art, especially music, is their passion. The village vagabond will sit all day over his violin or flute, and even the meanest village has one or more bands of 20 to 30 pieces, and they will play much better than the regimental bands of the surrounding English colonies. They like the *dolce far niente*, revery, melancholy, but are also eager to hear stirring tales of adventure, new discoveries and inventions, mythological and ghost stories. Their superstition is rather practical than religious, by which is meant that they believe less in spirits than in the magical action of healing herbs, in the laying on of hands in disease, etc., and therefore they were early attracted by the Catholic Church. Unfortunately they know very little of Spanish, so that they have no means of improving themselves by reading, their material in this respect being almost exclusively prayer-books, a few stories about the saints, etc. Whenever any other kind of reading in their language comes in their way, such as tales of chivalry and enchantment—even quack advertisements and the like—they devour them greedily. In another passage in his letters, Zobel, speaking of the relation of the natives to the monks and the tobacco monopoly, says that the latter were attempting to represent both to the colonial and the home governments that they alone can offer a sure support to the government, since they can keep the mass of the natives in check by their moral influence without other aid. This claim, he continues, was only true to the extent that the natives, timid, indifferent, and lazy as they are, fear the white monks and pay them a superstitious obedience, but do not love them. In the provinces where tobacco is grown the natives are not allowed to cultivate anything else. The state sells it for cash, but pays the farmers in paper, which is not redeemable for two, three, or even four years, so that they are compelled to sell their certificates to the Chinese or Spanish usurers at a great discount. Even this is borne patiently by the easy-going people. But religious fanaticism, which is not rare among the lower native priests (who are excluded from all higher spiritual dignities), sometimes leads to dangerous revolts of the natives (as in 1842), whose customary mildness and indolence are liable occasionally to change into blind fury." It is stated by travellers that in all villages there are schools under the supervision of the priests. In 1889 a school of agriculture and in 1890 a school of arts and sciences were established in Manila. There are four Paulist colleges and seminaries in the islands Luzon, Cebu, and Iloilo, with (in 1885) 1580 male and 40 female students. According to a Spanish authority, there were in the archipelago 1016 schools for boys, 592 for girls—total, 1608; and an attendance of 98,761 boys and 78,352 girls—total, 177,113.

Commerce and Transportation.—The commerce between Manila and the other islands of the archipelago, while quite large, does not afford any official statistics, and is carried on in steamers of from 500 to 100 tons. Mail steamers ply regularly on four routes. There are 17 principal and 16 secondary lighthouses on the coasts to facilitate navigation. A single railway, built by English capital, runs from Manila to Dagupan, about 120 miles. The roads about Manila are macadamized, but elsewhere they are largely of mud, and transportation is by means of sledges drawn by the buffaloes. Telegraph lines connect Manila with the different provinces of Luzon, and there are cables to the Visayas and other islands, connecting with Borneo and Singapore, besides a cable from Manila to Hong-Kong direct. The telegraph lines are owned by the government, the cables, heavily subsidized, being the property of an English syndicate.

The total value of exports for the year 1899 from the Philippines to the United States was \$4,409,774. The imports (including gold and silver) from the United States were in the same year \$404,193.

The Civil Commission.—On January 21 President McKinley appointed a commission to investigate the state of the Philippines. The commission was composed of Dr. Jacob Gould Schurman, president of Cornell University; the Hon. Charles Denby, at one time United States minister to China; and Professor Dean C. Worcester, of the University of Michigan. They were instructed to act in association with Admiral Dewey and General Otis, and to "facilitate the most humane and effective extension of authority throughout the islands, and to secure with the least

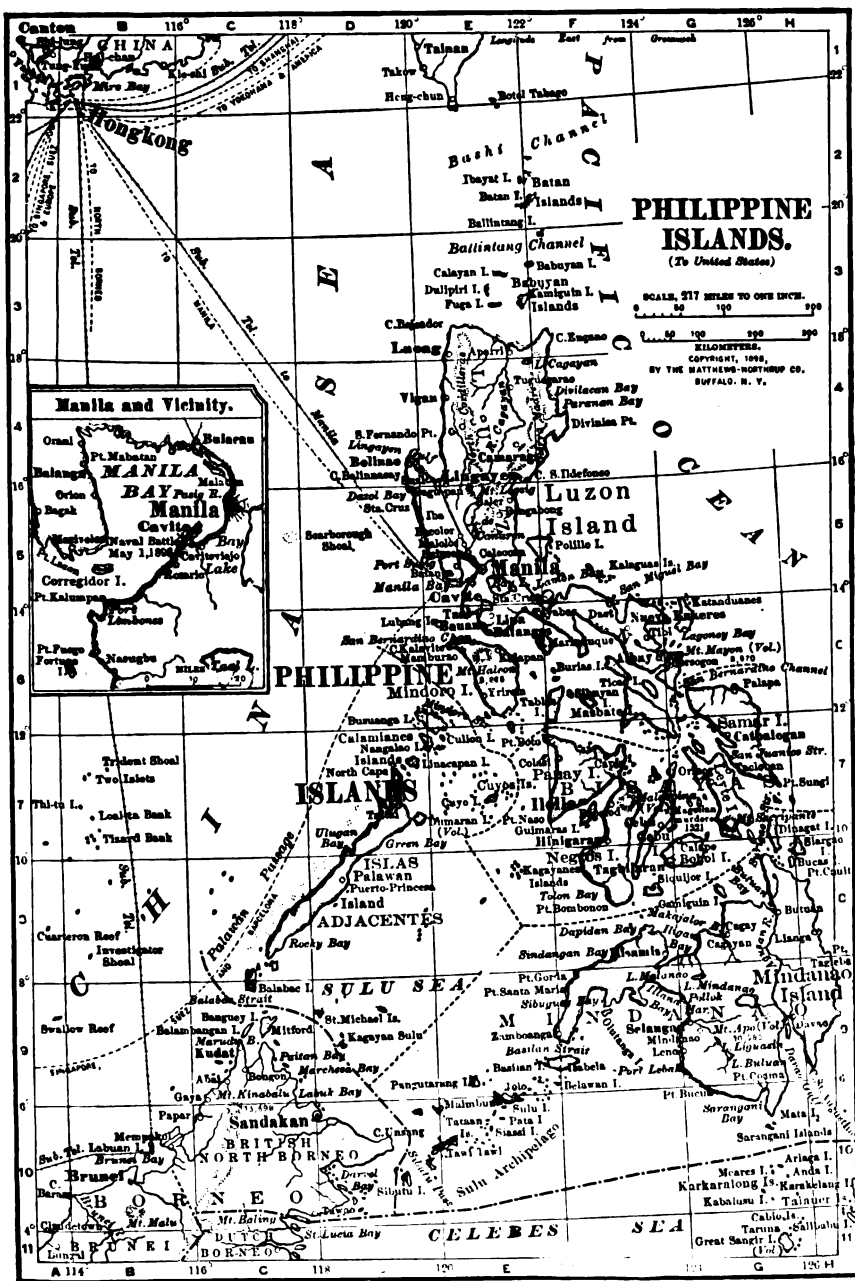
possible delay the benefits of a wise and generous protection of life and property to the inhabitants." A preliminary report of the work of the commission was published on November 3, 1899, and formed a part of the President's annual message on December 5, 1899. The report states that at no time have the Filipinos, or that portion of them who are Aguinaldo's followers, fought for independence, and the whole insurrection is the result of the personal ambition of Aguinaldo himself. The rebellion is therefore in no sense a national uprising, many of the Filipinos being friendly to the Americans, and in the provinces outside of Luzon the insurrection is looked upon by the natives with indifference where it has not inspired actual fear. Upon the arrival of the commissioners they instituted municipal governments, first in Bacoar and Imus and later in Paranaque, Las Pinas, and a dozen or more other towns. (For the organization of provisional governments in Negros and Sulu see the article UNITED STATES.) The report concluded by pointing out that withdrawal of the American forces would end in a state of anarchy in the islands, and result in their division among other great powers of the world; and that the Filipinos, never having had any experience in governing themselves, are, while naturally an intelligent race, incapable of self-government, which, though the final aim of American control, should be but gradually intrusted to them. For a more extended account of the operations of the United States Army in the Philippines during 1899 see UNITED STATES (paragraph History).

PHILOLOGICAL ASSOCIATION, AMERICAN, organized in 1869, had in 1899 a membership of 483. General meeting for 1900 at Madison, Wis., July 3-5. Publishes *Transactions and Proceedings*. President, Professor Abby Leach; secretary, Professor Herbert Weir Smyth, Bryn Mawr, Penn.; acting secretary, 1899-1900, Professor Harold N. Fowler, 49 Cornell Street, Cleveland, O.

PHILOLOGY. As a consequence of the necessarily protracted nature of philological work of whatever kind it may be—in phonology or any branch of comparative grammar, in lexicography or in text editing and criticism—it is a matter of extreme difficulty to state with definiteness a particular year's results. "Epoch-making" works at the present stage of the development of the science are destined rarely to appear, and although there never was in the history of Indo-Germanic philology such widespread activity and interest as is evinced at the end of the century, in Europe and America, by the publication of philological material, it is not at all an easy task to show clearly in an article of the scope of the present the direct bearing of the year, either upon the general science or, except in single instances, upon its special phases. Philological results, to an extent shared by scarcely another science, are given to the world in fragments, which take the form of fascicles, that frequently enough do not appear consecutively. This is particularly true of almost all extended dictionary undertakings, many of which are now under way: The great *Oxford English Dictionary* and the *English Dialect Dictionary* in England; the *Deutsches Wörterbuch* in Germany; the *Woordenboek der Nederlandsche Taal* in Holland; the *Ordbog öfver svenska språket* in Sweden; and the *Dictionnaire général de la langue française* in France, let alone various important dictionaries of epochs of a language, like Godefroy's *Dictionnaire de l'ancienne langue française*, or glosses of a dialect like the *Schweizerisches Idiotikon*, or the *Wörterbuch der elsässischen Mundarten*, all of which are in more or less active progress, but none of which is complete.

The same thing is true of important publications of sources, to cite single instances, like the great *Corpus inscriptionum latinarum* of the Berlin Academy; the *Inscriptiones græcæ insularum maris Ægæi* (Berlin); the *Codices græci et latini photographice depicti* duce Scatoni de Vries (Leiden); the *Quellenwerke der altindischen Lexicographie* of the Vienna Academy; or the verbatim edition after the MS. of Middle High German poems, *Die grosse Heidelberger Liederhandschrift*, all of which have been substantially added to during the year. The same is true, again, of numerous text publications in all parts of the field, which perforce appear slowly and by instalments, so that a long series of years is needed to complete them. The report of a single year can be in almost countless cases but the familiar one of "progress."

With regard to work more specifically grammatical, the difficulty is still further complicated by the fact that such material is more than ever fragmentary, and is scattered, often in short articles, through the numerous *Journals* and *Zeitschriften*, or in the *Proceedings* of learned societies throughout the world. It is only comprehensive works of extended scope that can, for a considerable period of development within the science, even reasonably control the wealth of such material. Such works are in progress in various parts of the field. There is, for instance, in the whole broad subject of comparative grammar the new edition, necessitated by the growth of the subject, of Brugmann's *Grundriss der vergleichenden Grammatik der indo-germanischen Sprachen* (Strasburg); in the special field of Germanic philology the new edition of Paul's *Grundriss der germanischen Philologie* (Strasburg); in Romance philology, Gröber's *Grundriss der romanischen Philologie* (Strasburg);



in Iranian, Geiger's *Grundriss der iranischen Philologie* (Strasburg). All of these are under way, but appear at irregular intervals in parts and fascicles, as the case may be.

The present article, in the face of such conditions as have been indicated, does not attempt an exhaustive bibliography of the philological output of the year. A selection only has been made of important works, that are either complete in themselves, or else exhibit tendencies that are of general or special interest for their bearing upon the development of the science.

An important monograph bearing upon a law of language is by Lionel Horton-Smith, *The Establishment and Extension of the Law of Thurneysen and Havet* (Cambridge). The Thurneysen-Havet Law of the change of Latin *ōv* to *āv* was first formulated in *Kuhn's Zeitschrift*, Vol. XXVIII., and in *Mémoires de la Société Linguistique*, Vol. VI. The present monograph is essentially the reprint of two articles which originally appeared in the *American Journal of Philology*. Its purpose is to extend the application of the law and to establish its chronology. According to the author, as a consequence of a very open pronunciation of the Latin *o* before *u* and *v*, *ov* was changed to *av*, *ōv* to *āv*, *ou* to *au*. This change took place in the latter part of the third century, A. C., among the educated class; not, however, before the beginning of the second century among the lower classes. The change of *ov* to *av* is absolutely proved by the imperative *fove* for *fave* in an inscription of the third century, printed by Bücheler in the *Rheinisches Museum*, Vol. LII. There is no such absolute proof for *ōv* to *āv*, *ou* to *au*, but there is an altogether strong probability of the integrity of the assumed working of the law in its entirety. The Thurneysen-Havet Law is entitled by the establishment of the change of *ov* to *av*, as explained, to be ranged with the already long list of the laws of language as understood by present-day philologists: with Grimm's Law, Grassmann's Law, Verner's Law, Conway's Law, Moulton's Law, Sievers's Law, Paul and Kluge's Law. For concise formulations of these laws of sound change, with illustrative examples, see Clark's *Manual of Linguistics* (New York, 1893). Immediately bearing upon Greek and Latin is the syntax part of Riemann and Goelzer's *Grammaire comparée du grec et du latin* (Paris). Like the Horton-Smith monograph, this has, however, a wider importance for its connection with the whole science of comparative linguistics. Monographs on particular phases of Indo-Germanic philology are: H. Hirt, *Der indogermanische Ablaut* (Strasburg), and E. Audouin, *De la déclinaison dans les langues indo-européennes* (Paris). Of importance for its general bearing upon the whole field is the fact of the completion of the extremely useful dictionary of the Amsterdam professor, C. C. Uhlenbeck, *Kurzgefasstes etymologisches Wörterbuch der altindischen Sprache* (Amsterdam), which distinguishes itself, as did its predecessor, the etymological dictionary of Gothic (1896), for its admirable precision and clarity.

Greek.—The year has seen the completion of the second volume of the important *Sammlung der griechischen Dialekt-Inschriften*, under the general editorship of Hermann Collitz (Göttingen). The present volume contains the Doric inscriptions from North and Middle Greece and the Peloponnesian Achaia, together with its colonies. The greater part of the work is made up of the Delphic inscriptions, upon which alone their editor, Johannes Baunack, has worked for thirteen years. This whole undertaking is one of the most important extended philological labors at present in progress, and in its results will be of the utmost value not only for its bearing upon the history of the Greek language, but upon broader questions of general linguistics. Bearing upon single phases of the history of the Greek language is an able monograph by O. Lagercrantz, *Zur griechischen Lautgeschichte* (Upsala). On Greek metre is a suggestive little work by P. Masqueray, *Traité de la métrique grecque* (Paris).

The most important book of the year in Homer criticism is Victor Terret's *Homère étude historique et critique* (Paris). The author's purpose is to show the futility of the attack made during the last hundred years—namely, since the appearance of Wolf's *Prolegomena*—upon the unity of the Homeric poems. According to him, all such efforts have failed in the light both of the undeniable structural unity of the poems and of the unmistakable testimony of antiquity. Homer to him is a historical person who was born in Smyrna in the tenth century, B. C., and lived a part of his life in Chios. The *Iliad* and the *Odyssey* are both his works—the *Iliad* having been composed in the best period of his maturity, the *Odyssey* in his old age. Both arose without the aid of writing, and only at a later period were written down and spread abroad by rhapsodists. He further insists that they are thorough unities in the sense of Aristotle. To disprove the contrary opinion, he investigates their construction, particularly as compared with other long poems, and considers in detail the arguments that have been brought against them. In carrying out his investigation, the author takes account not only of the writings of Wolf, Lachmann, Kirchoff and the rest, whose work stands in the front row of Homer criticism, but of out-of-the-way monographs and articles in the philological journals. Four maps are given

to illustrate the text, and beside other illustrations there is a facsimile of the papyrus *Louvre No. 3*, and a specimen extract from the *Iliad picta*. Not the least valuable part of the book is the bibliography at the end, which contains not only a short description of the principal manuscripts and the oldest editions of the poems, but also a chronological view of the whole Homer literature since Wolf. The 75 pages devoted to this bibliography show the extraordinary attention and the tremendous amount of labor that has been bestowed within the century upon the Homeric epics.

An addition to the abundant literature of last year on Bacchylides is by Joh. Schöne, *De dialecto Bacchylidea*, an inaugural dissertation published as a number of the *Leipziger Studien*. The monograph is a systematic consideration for the first time of the language of the newly discovered fragments of the poet whose renaissance has attracted such widespread attention.

One of the most important publications of the year is the second volume of the Egypt Exploration Fund material, *The Oxyrynchos Papyri*, edited with translations and notes by B. P. Grenfell and A. S. Hunt (London). This second part does not yet exhaust the material found in Oxyrynchos alone, in that some three-fifths still remain to be deciphered. Some of the principal contents of the volume are: No. 208, the badly mutilated parts of a papyrus of the third century, which contained the gospel of John; No. 211, fifty-four verses of Menander, tolerably well preserved, forming nearly the entire close of one of the comedies and containing many marginal notes as to the entrance and exit of the actors; No. 212, fragments of Aristophanes; No. 215, prose of an Epicurean, possibly of Epicurus himself; No. 220, a treatise on metrics, with citations of verse, in part new, in a MS. which appears to be from the beginning of the second century; No. 222, fragments of a complete list of the Olympic victors in the years 480, 476, 472, 468, 456, 452, 448—namely, just at the time of Pindar and Bacchylides; No. 223, considerable fragments of the *Iliad*, without particular value; No. 224, fragments of Euripides's *Phanissa*; No. 225, a small fragment of Thucydides; No. 226-227, fragments of Xenophon's *Hellenica* and the *Economics*; No. 228-229, fragments of Plato's *Laches* and *Phaedo*; No. 230-233, parts of Demosthenes's *De corona* and *c. Timocratem*. The book also contains non-literary material; among the most important is a petition, from the time of Commodus, directed to the Prefects by Dionysia, in the matter of a suit brought against her by her own father. Although this second volume contains but little new material in actual literature, it is, nevertheless, like its predecessor, of the utmost value not only for its wide bearing upon our whole knowledge of antiquity, but in a narrower way upon text criticism, grammar, and phonetics. A work belonging to the same category is *Greek Papyri (B.C. 100 to A.D. 700) in the British Museum*, edited by F. G. Kenyon (London). The book, the second volume of the work, contains a catalogue with texts. The accompanying *Atlas of Fac-Similes* has no less than 123 plates. The same author publishes this year *The Palaeography of Greek Papyri* (Oxford, Clarendon Press), which contains as comprehensive an account as it is possible at this time to give of the results of the recent extraordinarily fruitful labor in this field. The book considers the preparation of the papyrus, the size of the rolls, the codex form, accentuation, word separation, and abbreviations. Three periods of non-literary papyri—which on account of their documentary character are in the main readily dated—are to be distinguished: the Ptolemaic, for which the form of the Ξ , made up of three unconnected lines, is an unmistakable criterion; the Roman, with its rounded forms, and the Byzantine. Accompanying fac-similes illustrate these differences. On the basis of this knowledge, furnished by the non-literary papyri, the literary, which sometimes are written on the back of the others, are dated. These belong exclusively to the Ptolemaic and the Roman periods; no literary papyri whatever appear in the Byzantine period, since parchment then wholly takes the place of the other material. The alphabets of the literary papyri are illustrated. Another work of the year in paleography that may be mentioned in this connection is Ch. Reusens's *Éléments de paléographie* (Paris).

E. Legrand and H. Pernot in *Chrestomathie grecque moderne* (Paris) have put together a number of reading extracts intended as an introduction to the popular language of modern Greece.

Latin.—In Latin one of the most important text publications of the year is the sixth and last volume of *The Correspondence of M. Tullius Cicero*, by R. Y. Tyrrell and L. C. Purser (Dublin). As the sub-title states, the work contains Cicero's correspondence arranged in chronological order, with a revision of the text, commentary and introductory essays by the authors, who have been engaged for twenty years on their edition. The present book includes no new manuscript material, but considers and tabulates new readings with the use of the entire critical literature at hand. The work will remain for a long time to come the definitive one in its special subject.

A number of works of greater or less extent bear upon the history of the Latin language. W. Heraens's *Die Sprache des Petronius und die Glossen* (Leipsc) is a programme. B. Maurenbrecher, in the first number of a series of important investigations

to bear the common title: *Forschungen zur lateinischen Sprachgeschichte u. Metrik* (Leipsic), considers *Hiatus und Verschleifung im alten Lateinischen*. R. S. Conway, in a little book with the title: *Dialectorum Italicarum exempla selecta* (New York and London), brings together for purposes of instruction specimens of the Italian dialects. G. Mohl furnishes new subsidia in his *Introduction à la chronologie du latin vulgaire* (Paris).

A. Cappelli's *Dizionario di abbreviature latine e italiane* (Milano) is, in part, subsidia in a new field. Walter's *Lexicon diplomaticum* is, as is generally recognized, the best aid to the intelligibility of Latin abbreviations in the manuscripts of the Middle Ages, a work to which Chassant's *Dictionnaire des abréviatures latines et françaises* forms at times a useful pendant. This new book, however, not only admirably covers the Latin ground, but puts us into possession, for the first time, of a dictionary of Italian abbreviations. The book contains over 13,000 abbreviations, in connection with which, in every case, the century is given in which the particular form occurs. The book is accurate and altogether useful.

Romance.—A new historical grammar of French has been begun by K. Nyrop, who has issued the first volume with the title: *Grammaire historique de la langue française* (Kjbenhavn). An English translation of Darmesteter has appeared during the year with the title: A. Darmesteter, *A Historical French Grammar*, edited by E. Muret and L. Sudre. English edition by A. Hartog (New York and London). A new edition has also appeared of E. Schwan's *Grammatik der Altfranzösischen*, revised by D. Behrens (Leipsic). A monograph bearing upon the history of French is H. Bergen's *Die Lehnwörter in der französischen Sprache ältester Zeit* (Leipsic), which considers, as its title indicates, the borrowed words in the oldest period of the language. On French dialects are: Guerlin de Guer's *Essai de dialectologie normande* (Paris), and E. Mâzuc's *Grammaire languedocienne (dialecte de Pézenas)* (Toulouse).

A historical grammar of Spanish is M. E. Torres y Gómez's *Gramática histórico-comparada de la lengua castellana* (Madrid).

What promises to be an extremely valuable addition to existing subsidia for the study of the Retho-Romanic dialects of Switzerland and the adjacent linguistic territory, for what, in short, has been called "the Swiss language," is the dictionary—the first part of which has appeared during the year—by E. Pallioppi, *Wörterbuch der romanischen Mundarten des Ober- und Unterengadins, des Münsterthals, von Bergün und Filisur* (Basel). This dictionary will form an admirable complement to Decurtins's *Rätoromanische Chrestomathie*, which is still under way.

A. Tobler's *Vermischte Beiträge zur französischen Grammatik*, 3. Reihe (Leipsic), contains a number of grammatical monographs which originally appeared in philological journals, for the most part in the *Zeitschrift für romanische Philologie* and the *Archiv für neuere Sprachen*. The book has, as an appendix, the author's rector's address of October, 1890, entitled, *Romance Philology at the German Universities*. In his preface the author vigorously expresses his discontent at the meagre result of his own efforts to enliven the interest in grammatical studies in Germany, and his general dissatisfaction with the whole recent trend toward utilitarianism in the study of the modern languages.

Germanic.—Carl Kraus's *Heinrich van Veldeke und die mittel-hochdeutsche Dichtersprache* (Halle) is an important book bearing upon the history of the German language and literature. The problem for solution is how and why Van Veldeke, a Netherlander, should have become, as he undoubtedly was, the father of the Middle High German Court epic. The character of Van Veldeke's rhymes is in sharp contrast with the usage of the other Middle Dutch poets. The author shows that Van Veldeke, bearing in mind the High German public to whom he wished to appeal, consciously avoided wherever it was possible all peculiarities in rhyme that were specifically Dutch, although it is apparent that this could not be done invariably. The exigencies of rhyme play here, from the nature of the case, an extremely important rôle, and not infrequently the poet, in spite of his desire to avoid them, was obliged to use dialectic combinations to express his thought. This conscious normalization of his language is particularly apparent in his epics. His lyrics, however, are written in his own Limburg dialect. The normalization of his language rendered it readily acceptable in Germany; it brought in its wake, on the other hand, a considerable number of Low German elements, which then found their way into the language of the Middle High German poets.

A work of a kind that stands, it may be, apart from work truly philological, and yet is of extreme importance for its bearing upon the present and future history of language development, is Paul Horn's *Die deutsche Soldatensprache* (Giessen). As student life has its own by no means inconsiderable vocabulary, so army life has evolved a vocabulary that to a certain extent is peculiar to it. It follows as a matter of course, however, that not all words that differentiate such a soldier vocabulary, whether it be German or English, from the normal language are specifically army

evolutions. Every such vocabulary of a class or a calling will necessarily contain, together with its own special creations or adaptations, elements from other non-literary sources: common slang, thieves' jargon, student terms, popular expressions, and the like. Such a soldier language will inevitably have, too, its influence upon the others, and also upon the literary language by their ultimate adoption of its expressions. A work like this in inherent kind is by B. E. Gent, *New Dictionary of the Terms, Ancient and Modern, of the Canting Crew in its Several Tribes of Gypsies, Beggars, etc.* (London).

D. C. Hesselning's *Het Afrikaansch* (Leiden) is, as its subtitle states, a contribution to the history of the Dutch language in South Africa, which subject, apart from its inherent philological interest, has acquired a specific interest from the Anglo-Boer war in this very territory. This is not the first work in the same field. Its author has used material from Manjvelt, Schuchardt, Viljoen, and te Winkel, but has also collected a mass of new material from newspapers and from manuscript documents of the earlier Dutch Cape government in the archives at The Hague. The results of the author's investigations are as follows: The great majority of words and forms is from the dialect of North Holland, brought by the first colonists from their mother country. The terms for objects and acts which belong only to their new home have been taken pre-eminently from the Hottentots and Kaffirs. A slight accession to their vocabulary they owe to the French Huguenots, who came in after 1688 as a consequence of the religious persecutions of Louis XIV. A number of vigorous and abusive terms have come in from High German, in that a large number of German soldiers and officials have always been in the service of the Cape government. A considerable body of expressions has been borrowed, too, from the Malay-Portuguese dialect, which since the sixteenth century has been, like the *lingua franca* of the Mediterranean, the language of commerce in all the important seaports of the Indian Ocean and the medium of communication between the slaves who were brought into the country from all parts of Africa and India. In late years the language has naturally and irresistibly been influenced by the continually growing use of English in all parts of South Africa. This is such a monograph as sometime will be written on the history of the English language in America.

Slavonic.—New works in the Slavonic field important for their general bearing are: W. C. Morfill's *A Grammar of the Bohemian or Csech Language* (London) and the first part of a Polish grammar, A. Soerensen's *Polnische Grammatik* (Leipzig).

Journals in the field of Indo-Germanic philology published in America are: *American Journal of Philology* (Baltimore), quarterly, Volume XX. in progress; *Modern Language Notes* (Baltimore), monthly, Volume XIV. in progress; *Journal of Germanic Philology* (Bloomington), quarterly, Volume II. in progress; *Americana Germanica* (Philadelphia), quarterly, Volume II. in progress.

Series of monographs in this field in America, in which issues appear with more or less regularity are: (Harvard), *Studies in Classical Philology*; (Harvard), *Oriental Series, Studies and Notes in Philology and Literature*; (University of Pennsylvania), *Series in Philology, Literature, and Archaeology*; (University of Wisconsin), *Series in Language and Literature*; (University of Chicago), *Studies in Classical Philology, Germanic Studies, English Studies*; (Cornell), *Studies in Classical Philology*.

The *Publications of the Modern Language Association of America* (see MODERN LANGUAGE ASSOCIATION OF AMERICA) are contained in Volume XIV., made up, like its predecessors, of a number of monographs. The American Philological Association issues its yearly volume of *Transactions and Proceedings*.

PHOSPHATES. In 1898 the phosphate rock produced in the United States amounted to \$3,453,460, distributed as follows: Florida, \$1,847,796; South Carolina, \$1,107,272; Tennessee, \$498,392. Of the Florida output, amounts valued at \$360,505 were exported to various countries of the world, some of it going as far as Australia. C. W. Hayes contributes an article on the Tennessee Phosphate Fields to the Twentieth Annual Report of the United States Geological Survey.

PHOTOGRAPHY. In color photography, three negatives of the subject are made: one through a colored screen, allowing only the red rays to pass; one through a screen allowing only the blue rays to pass, and a third through a screen allowing only the yellow rays to pass. In 1899, Mr. Frederick E. Ives invented an instrument he calls the kromscop. This contrivance has on its surface three glasses, red, blue, and green, against which are placed the corresponding images of the color record. Below the colored glasses, within the instrument, are transparent reflectors of colored glass, and without is a reflector for throwing light into the interior of the instrument. When looking through the eyepiece, set like the eyepiece of a stereoscope, the different images are apparently seen in the same place with the result of a single image in solid relief and in the natural colors.

PHOTOTHERAPY. Dr. Finsen, of Copenhagen, has devised recently a method of applying light for therapeutic purposes, founded on the following data: (1) The bactericidal property of the chemical rays of light; (2) the power of the chemical rays of light to produce an inflammation of the skin (sunburn, *erythema solare*); (3) the power of the chemical rays of light to penetrate the skin. The violet and ultra-violet rays of light obtained from the sun or from an electric arc-lamp will, in a few hours, kill plate-cultures of *bacillus prodigiosus* at a great distance. The so-called sunburn is not a burn. If sunlight or electric light be passed through a layer of distilled water so as to cut out the ultra-red rays (the dark rays of heat), the resulting skin-inflammation is as great as if the light were uncontrolled. If sun light be thrown upon the skin through a glass screen which cuts out the violet and ultra-violet rays, there is no resulting inflammation. To establish the third datum, small sealed bottles, containing muriate of silver, were placed under the skin of some animals kept in the dark, and of some animals exposed to sunlight. An hour later the tubes were removed, and it was found, in every experiment, that the muriate of silver was blackened in the cases of those animals which were exposed to the sun, but not in those kept in the dark. Experiments were made to show that the chemical rays of light penetrate more easily in bloodless tissues than in those filled with blood. A piece of sensitized paper was put against the back of a man's ear, and the blue and violet rays of light were allowed to fall on the front of the ear. No reaction took place in five minutes, the paper remaining unchanged. Replacing the paper and pressing the ear closely between two glass plates, the paper was blackened after 20 seconds' exposure to the same chemical rays. Quoting from the article by Bie, Finsen's assistant, in the *British Medical Journal*: "In the treatment of patients sunlight is used in the summer, when the sky is bright, otherwise the light of electric arc-lamps of 50 to 80 ampères. As already explained, it is only by concentration that the light becomes so powerful that its bactericidal property can be used in treatment. In order to avoid burning the skin it is also necessary to cool the light. This double object—to make the light stronger and cooler—is attained, in regard to the sunlight, by an apparatus consisting of a lens of about 20 to 40 centimetres in diameter. The lens is composed of a plain glass and a curved one, which are framed in a brass ring, and between them there is a bright blue, weak, ammoniacal solution of copper sulphate. As one surface of the liquid is plain, the other one being curved, its optical function is that of an ordinary plain convex glass lens. By making the lens of a blue liquid instead of solid glass a considerable cooling of the light will be obtained, because water absorbs the ultra-red rays, and because the blue color excludes a considerable amount of the red and yellow rays. These three kinds of rays have particularly strong heating effect, while their bactericidal power is insignificant. On the other hand, the blue, violet, and ultra-violet rays, which it is important to procure in as great a number as possible, are but very slightly impaired by passing through the blue liquid. The lens hangs on a foot, made in such a way that the lens can be raised and lowered as well as turned on a vertical and horizontal axis; therefore it is easy to place the lens perpendicularly to the sun-rays, and at such a distance as to make the light strike the area of skin which it is intended to treat. Finsen's apparatus for concentrating the electric arc-light consists of lenses of quartz framed in two brass tubes which can be moved, the one into the other, like the two pieces of a telescope. Lenses of quartz are used because this material in a far higher degree than glass allows the ultra-violet rays of shortest wave-length to pass through, and it is just the ultra-violet rays that have a considerable bactericidal effect. The apparatus for concentrating the sunlight may, on the other hand, be made of glass, because all the ultra-violet rays of the sunlight have so long a wave-length, that they can pass through glass; those of a shorter wave-length are already absorbed by the atmosphere.

"In the part of the apparatus which faces the lamp, two lenses are placed that have together a focal distance of 12 centimetres; when the apparatus is placed in such a way that the first lens is exactly at this distance from the points of the carbons of the lamp, they consequently will concentrate the divergent rays coming from the lamp and make them parallel; these rays pass through the brass tubes, at the distal end of which they meet again with two lenses of quartz, which concentrate the parallel rays, making them convergent in such a way that they are united about 10 centimetres outside the outer quartz lens. Between these two lenses there is distilled water, which cools the light by absorbing the intensely heating ultra-red rays, but does not impair the blue, violet, and ultra-violet ones. It is not possible, as in the apparatus for the sun, to make the water blue in order to cool the light further, because the extreme ultra-violet rays, which abound in the electric light, may well pass the quartz, but get absorbed by the blue coloring matters; the advantages of using the lenses of quartz would consequently be lost if the light got cold through a blue solution. Of course the distilled water between the quartz lenses gets heated by

the absorption of the ultra-red rays. In order to avoid too much heating (boiling), cold ordinary water may be run through the mantle surrounding this end of the apparatus.

"Four such apparatus for concentrating are fixed to an iron ring round each lamp, this ring again being fixed to the ceiling by four iron supporters. The lamp is movable up and down by a mechanism, and can be put exactly into the centre of the ring by the aid of four strings, which are connected with screws in the iron support. The apparatus for concentrating hangs on iron arms, fastened to the ring, and depends from this at an angle of about 45°, because the lamp sends out the strongest light in this direction; the apparatus for concentrating can be put nearer to or further from the lamp by sliding on the iron arm. By this disposition the lamp and the apparatus for concentrating can be fixed so that the points of the carbons are exactly in the focus of the front lenses of all the four apparatus. The apparatus for concentrating can be revolved on a perpendicular axis and a horizontal one by three screws; by this they can be so placed that the axis of the apparatus gets fused with the axis of the parallel rays, so that no light may strike the brass cylinders. The distant focus can be placed at the height which suits the patient by pushing the lowest cylinder into the uppermost one of the concentrating apparatus.

"Through the two forms of apparatus for concentrating already described the concentration and cooling of the light are thus affected. But the light is still too warm to be applied to the skin without hurting it; the skin must therefore be cooled in order to avoid burning. This is effected by a little apparatus consisting of a plate of quartz and a plain convex lens of quartz, both framed in a conical brass ring, which carries two small tubes and four arms; to each arm is fastened an elastic band, by means of which the apparatus is pressed against the skin. By making cold water run into one of the tubes and out of the other one, the skin may be cooled to such a degree that it can stand even the strongest light. By the pressure which the plano-convex quartz lens exerts on the skin this is made anemic, so that the chemical rays penetrate it much better, as I have described it already.

"In this manner an area of skin of 1½ centimetres in diameter is treated for one hour each day. The treated skin reddens and swells, a bulla may appear, but necrosis has never been observed.

"We have tried to treat different skin-diseases known or supposed to be of microbic origin, but it is only of *lupus vulgaris*, *lupus erythematosus*, and *alopecia areata*, that we have treated a number of cases great enough to estimate the value of the method."

PHYSICAL GEOLOGY. Alexander Agassiz has published a volume on the island coral reefs of Fiji, and shows that the islands of the whole group have been elevated, and then remained nearly stationary, and exposed to a great and prolonged process of denudation and submarine erosion, which has reduced them to their present height. The submarine platforms upon which the barrier reefs have grown are merely the flats left by the denudation and the erosion of the central island. His observations on Fiji intend to emphasize that no general theory can be formulated for all coral reefs. Formerly the Yellowstone Lake had an outlet to the south at Overlook Mountain, but now the lake empties to the north over the great falls of the Yellowstone and through the Yellowstone Cañon, which is very young geologically, and was formed by the backward cutting of the upper waters of Sulphur Creek, an arm of the Lamar River, the cutting having taken place through one of the ridges of the continental divide. Recent studies made of the Triassic of eastern North America indicate that the Virginia-North Carolina Triassic region was an area of maximum stability, or of minimum movement during Triassic time. Tolman discusses the carbon dioxide of the ocean and its relations to the carbon dioxide of the atmosphere. F. P. Gulliver, in a paper on Shore-line Topography, points out the origin of the different coast forms, and suggests a number of new names. Recent movement on the line of a tertiary fault, along the northeastern base of the Lepini Mountains of Italy, has produced a well-defined scarp in places 100 to 200 feet high, and traceable five miles or more.

Among other important publications are: one on the elevated sea margins of northern Europe, by the Finland Geological Survey; Preliminary Notes on the Surface Geology of the Yukon Territory, by O. Nordenskjöld, *American Geologist*, May, 1889; Planation and Dissection of the Ural Mountains, F. P. Gulliver, Bull. Geol. Soc. Am., Vol. X. *The Earth's Sculpture, or the Origin of the Land Forms*, by James Geikie, is a very readable little book.

For several years American geologists have been in the habit of explaining a certain levelness of hill crest in many regions, as, for instance, New England, on the basis of the assumption that they have been worn down to the condition of almost a plain, or peneplain, as it has been called, then elevated and dissected by weathering and erosion. This explanation, which has usually been accepted, has in

the last year been questioned, with the result of bringing forth much desirable discussion, which may result in showing that the theory has not as wide a range of application as formerly supposed.

PHYSICAL SOCIETY, AMERICAN, organized May 20, 1899, for the advancement and diffusion of physical knowledge, held its first regular meeting October 28, 1899. Four regular meetings are to be held each year, ordinarily in New York. Annual dues, \$5; membership, 90. President, Professor Henry A. Rowland; secretary, Professor Ernest Merritt, Ithaca, N. Y.

PHYSICAL TRAINING. The recent introduction of physical training into American public schools makes appropriate, at the present time, some account of the history of physical training in Europe and America. Systematic physical training as a part of the regular public education dates from 1774, though the greatest development has taken place since 1860. In Germany teachers are carefully prepared to give instruction in gymnastics, and are required to pass theoretical and practical examinations, the former both oral and written. The subjects include anatomy, physiology, history of the various systems of gymnastics, and first aid to the injured. Physical training is made compulsory for all pupils in Prussian schools; and in the cities there is much appropriate apparatus supplied, instruction is given in swimming, and skating-ponds are devoted to use of pupils. A regular course of gymnastics begins at as early an age as 6 years, and continues in gradual increase of complexity and difficulty. The course includes free light and heavy gymnastics, fencing, marching, jumping, and climbing exercises, etc., for boys, and for girls the ordinary free gymnastics, class gymnastics, with skipping ropes, dumbbells and wands, marching, balancing and dancing, ball games, jumping, swinging, climbing, and the parallel and horizontal bars. The exercises are often accompanied by singing.

Probably the most famous system of gymnastics is the Swedish, founded by Peter Henry Ling, who was born in Sweden in 1776, and died in 1839. At the age of 24 he was appointed fencing master at the university in Lund, Sweden, and in 1813 in the gymnastic institute of Stockholm. He recognizes four divisions of gymnastics, as follows: (1) Pedagogical gymnastics, by which one learns to bring his body under the control of his own will. (2) Military gymnastics, in which one seeks by means of an external thing, for example, a weapon or by means of his own bodily power, to subject the will of another person to his own. (3) Medical gymnastics, by means of which one seeks either by his own proper posture or with the help of another person, and by helpful movements, to diminish or overcome the ailment which has arisen in his body through its abnormal relations. (4) Æsthetic gymnastics, through which a person endeavors to give bodily expression to the inner being, thoughts, or impressions. He developed his ideas as to the therapeutic value of exercise into what has since become the "Swedish movement cure." The military gymnastics resemble the German gymnastics. In the school physical training, much emphasis is placed on accuracy of movements, and the progress from day to day and from one exercise to another is rational. The Swedish system is gradually growing in favor now in European countries, which previously followed the German system. In the United States the physical training is as yet in a relatively backward state, but a fresh interest is springing up and much progress is being made. Schools for the instruction of teachers of physical training are found in Milwaukee, Springfield, Boston, and Cambridge, Mass., and New Haven, Conn., and there is a number of summer schools. The number of teachers of physical training increased fourfold between the years 1887 and 1896. Public swimming baths and schools and open gymnasiums have been equipped in Boston and Brookline, Mass., and in New York. Not only is more attention being paid to physical training in the public schools of the country, but exercises and games are being taken up in the posts of the regular army, in insane asylums, and, notably, in the Elmira, N. Y., reformatory. Swedish educational gymnastics were largely introduced in Boston by Americans interested in it, and not by the Swedes in this country, unlike the German systems which have been industriously propagated by the many *turnvereins* in the United States.

PHYSICIANS, ASSOCIATION OF, AMERICAN, held its fourteenth annual session at Washington, D. C., May 2-4, 1899. This being a society for the special study of special diseases, nearly all the time was devoted to the discussion of scientific subjects. Officers elected: President, E. G. Janeway, M.D., New York City; secretary, Henry Hun, M.D., Albany, N. Y.

PHYSICS. In this article is given a brief account of some of the important advances that have been made in physics during the year 1899. Each subject is treated in a paragraph by itself with an appropriate heading. Frequent references are given, so that the reader may go to the original publications if he desires. The abbreviations are explained at the end of the article.

DYNAMICS.

Quartz-Thread Gravity Balance.—Professor R. Threlfall and J. A. Pollock have designed and constructed an instrument for measuring variations in gravity from one place to another, which seems to have some great advantages over any previous instruments. In principle it consists of a spring, operating on a mass, the spring tending to move the mass in one direction, while the gravitational attraction of the earth tends to move it in the opposite direction. The spring consists of a horizontal quartz thread stretched between two supports. A small piece of brass wire is fastened at right angles to this thread at the middle. One of the supports to which the thread is fastened is capable of being turned around the axis of the thread, with a divided circle to measure the amount of turning, so that the thread can be twisted. The small piece of brass wire has its centre of gravity a little distance from the thread, and if the thread is twisted through about three complete turns, the wire becomes horizontal. This wire is then acted on by the earth's gravitational force tending to turn it in one direction, while the elastic force of the thread tends to turn it in the other. If the instrument is moved to a different place where the gravitational force is different, the brass wire will move a little from its position, and it will require a little turning of the support at one end to counterbalance this. The amount of the turning is used to measure the difference in the acceleration of gravity at the two stations. It is necessary to keep the instrument at a constant temperature, as the elasticity of the quartz changes with the temperature. There are other precautions and corrections that must be observed, but the authors believe, as a result of a good many tests, that an accuracy can be obtained of 1 part in 500,000 of the value of the acceleration of gravity. The instrument, of course, only measures differences in the acceleration in terms of some standard difference, that must be previously measured by some absolute method, as with the pendulum. —*Proc. Roy. Soc.*, 65, 123, 1899.

Mass of a Cubic Decimetre of Water.—The mass of a cubic decimetre of water has just been measured with a greater degree of accuracy than heretofore. In the metric system (*q. v.*) of weights and measures it is well known that starting with the unit of length, called the metre, it was decided to take for the unit of mass, to be called the gramme, the mass of 1 cubic centimetre of water at its greatest density, which is at 4° Centigrade. As a material standard a mass of platinum was prepared, intended to be the mass of 1 cubic decimetre, or 1000 cubic centimetres of water at 4° C. This mass, which is called the Kilogramme des Archives, is kept in Paris, and is the standard of mass for the metric system. It was made, as was afterward found, a little too large to agree precisely with its intended size. The mass of a cubic decimetre of water, measured in terms of this platinum kilogram, was therefore a little less than a kilogram. The recent accurate measurement of the mass of a cubic decimetre of water, referred to above, was carried out by MM. Ch. Fabry, J. M. de Lepinay, and A. Perot. The point of their experiment consists in an extremely accurate measurement, by a method depending on the interference of light, of the volume of a cube of quartz. The quartz cube was placed between two perfectly plane and parallel pieces of glass, and by means of violet light interference fringes were obtained, which were photographed, and from them the departure of the cube from a perfectly cubical form could be determined. It was necessary also to determine the mass of water at 4° displaced by this cube. Then, of course, the mass of this quantity of water had the same ratio to the volume of the water—that is, the volume of the quartz cube—as the mass of 1000 cubic centimetres of water at 4° has to 1000 cubic centimetres—that is, we have the proportion,

$$\frac{m}{v} = \frac{M}{1000 \text{ cc.}}$$

in which m = the mass of the water displaced by the quartz cube, v = the volume of the cube, and M = the mass to be determined, the mass of 1 cubic decimetre of water at 4° C. The result of their experiment was that at 4° C. the mass of 1000 cubic centimetres of water =

$$999.9786 \text{ grammes} = 1 \text{ kg.} - 21.4 \text{ mg.}$$

—*C. R.*, 129, 709, 1899.

HEAT.

Solidification of Hydrogen.—Professor James Dewar, who succeeded last year in liquefying hydrogen, as noted in the 1898 YEAR BOOK, succeeded in 1899 in reducing it to the solid state—that is, in freezing it. This, of course, requires a much lower temperature to be attained than that needed merely for the liquefaction of the gas. This low temperature was brought about by allowing liquid hydrogen to evaporate rapidly under a low pressure, much lower than the atmospheric pressure. The first attempts were made in an arrangement represented in Fig. 1. Liquid hydrogen was placed in a small double-walled test-tube suspended inside

a larger double-walled test-tube, also containing liquid hydrogen. The gas above the liquid was exhausted at a very rapid rate, so that the pressure was only that of 10 millimetres of mercury. This attempt, however, was unsuccessful, as it required too large a supply of liquid hydrogen. It should be stated that the air is exhausted from the space between the walls of the double-walled test-tubes. Vessels of this type are much used in dealing with liquid air and other gases at very low temperatures. The vacuum prevents all conduction of heat.

The next attempt was made with an arrangement as represented in Fig. 2. The vessel *C* was filled with pure, dry hydrogen gas. This vessel was provided with a mercury manometer, and had a long tube, *AB*, which extended downward into the double-walled test-tube containing liquid hydrogen. The pressure of the gas over this liquid hydrogen was then reduced below that of the atmosphere, and liquid hydrogen immediately began to condense in the tube, *AB*. When the pressure reached about 30 to 40 millimetres the liquid hydrogen in the test-tube suddenly changed to a foam-like mass. This was suspected to be solid hydrogen mixed with solid air, which had leaked through the cracks in the corks. The whole apparatus was then turned upside down, to see whether the hydrogen in *AB* had solidified, and as it did not run out, it was assumed that this was the case. By looking at the tube in a strong light, and lowering the pressure still more, the solid mass in the test-tube became more transparent, and then the material in *AB* was seen to be a transparent, ice-like mass. By this apparatus the maximum fluid density of hydrogen was found to be .086, the liquid at its boiling-point under one atmosphere pressure having a density .07. Solid hydrogen melts when the pressure of the saturated vapor reaches about 55 millimetres. The temperature was determined, in the absence of any better way, by two constant volume gas thermometers enclosing rarefied hydrogen. Assuming these to work regularly at such low temperatures, the mean temperature of solid hydrogen was found to be 16° absolute under a pressure of 35 millimetres. The boiling-point is 21° absolute at one atmosphere pressure. The experiments show that solid hydrogen has not a metallic character, as was at one time thought to be probable.—*Nature*, 60, 514, 1899; *C. R.*, 129, 451, 1899; *Ann. Ch. Ph.*, 18, 145, 1899.

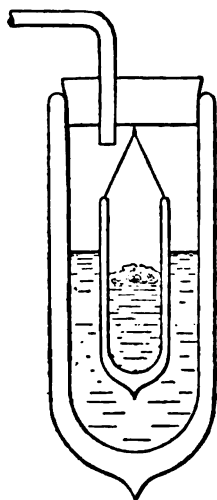


FIG. 1.

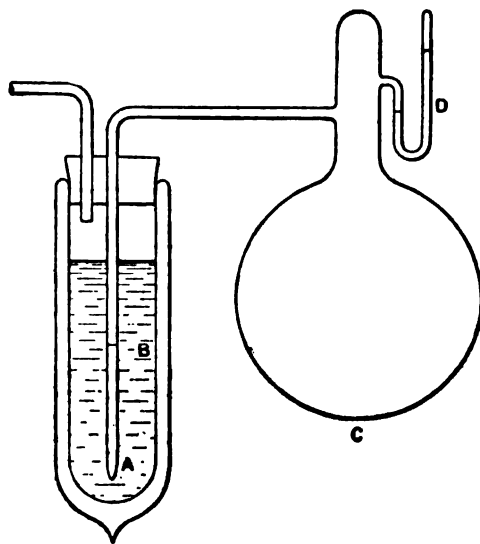
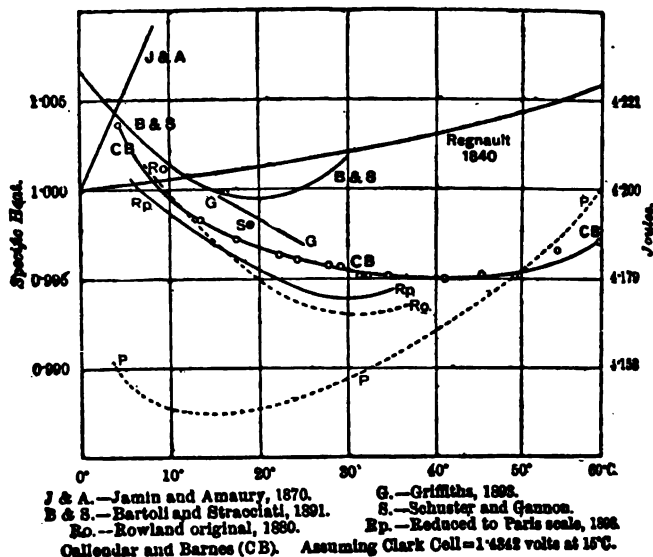


FIG. 2.

Specific Heat of Water.—The heat capacity of water, like its other physical properties, is one of the most important physical constants, as water is used as a standard in so many calorimetric determinations. The experiments made for the purpose of measuring this have, however, not given results which are sufficiently concordant. This is owing to the difficulty of the experiments, especially the thermometric part of them.

Heat is a form of energy, and in the C. G. S. system the unit of energy or work is the erg. This is the amount of work done by 1 dyne, the unit of force, when the point at which it is applied is displaced a distance of 1 centimetre. The specific heat of water, measured in mechanical units, is the number of ergs required to raise

the temperature of 1 gramme of water 1°C . This number is different for water at different temperatures, as the heat capacity or specific heat of water varies with the temperature. At a temperature of 10°C . it is not far from 4.2×10^7 ergs—that is, 4.2 Joules. The fact that the specific heat varies was discovered by Regnault, but H. A. Rowland, of Baltimore, was the first who discovered that it decreased from 0° to about 30° or 40° , and then increased again. The specific heat of water when measured in mechanical units has usually been called the mechanical equivalent of heat, and it is in the experiments made to measure this that the variation of the specific heat with the temperature first became evident. H. L. Callendar and H. T. Barnes have just published the results of some experiments made at McGill University, Montreal, to measure the specific heat of water by a new method. In their method there is a steady current of water flowing through a tube. In the middle of the tube there is a platinum wire, which is heated by an electric current, and a known amount of heat is thus supplied to the water per second. The difference of temperature of the stream before and after it reaches the electrical source of heat is observed by means of a differential platinum thermometer—that is, a platinum thermometer arranged so as to measure merely differences of temperature down to $0^{\circ}.001$. If E is the difference of potential between the ends of the platinum wire



which supplies the heat, C the constant current flowing through the wire, and t the time the current is kept flowing, then by Joule's law ECt is the amount of heat in mechanical units supplied in that time. If M is the mass of water that flows past the instrument in this time t , α° the change in its temperature, and J the heat capacity or specific heat in ergs—that is, the mechanical equivalent of heat, as it used to be called, at the mean temperature of the water—then $JMa\alpha^{\circ}$ is the amount of heat carried off by the water. A small amount of other heat will be lost by radiation. Let this amount, which can be allowed for, be called H . Then the total amount of heat carried off is $JMa\alpha^{\circ} + H$, and this is equal to the amount of heat supplied by the electrical current—that is, we have the equation,

$$ECt = JMa\alpha^{\circ} + H.$$

Solving this equation for J , we have its value in terms of quantities which can be measured. On account of the variation in the heat capacity of water a different value of J is found for every different mean temperature taken. The result of their experiments, a preliminary account of which was presented to the British Association for the Advancement of Science, at Dover in 1899, may be gathered from an inspection of the curves plotted in the accompanying diagram. The best previous determinations of the specific heat are shown by the curves marked Rp , which is Rowland's, reduced to the Paris hydrogen scale, and G , which is Griffiths's. Callendar and Barnes's curve comes in between these two, and is flatter than Rowland's. It has a minimum value at 40° higher in the scale. It shows also a much more rapid decrease in going from 0° to higher temperatures. Their results may also be

expressed between 10° and 60° by the following formula, in which S_t is the specific heat of water at t° and S_{40} is the specific heat at 40° , which is thus taken as a unit:

$$S_t = S_{40} \{1 + 0.0000045 (t - 40)^2\}.$$

This formula represents the experiments accurately through the range indicated, to within 1 part in 5000.—*Elect.*, 43, 775, 1899.

Comparison of Platinum and Nitrogen Thermometers.—During the past year a very careful comparison has been made between some platinum resistance thermometers and a nitrogen gas thermometer by Drs. J. A. Harker and P. Chappuis at the International Bureau of Weights and Measures in Paris. The measurement of temperature by platinum thermometers depends on the fact that the electrical resistance of a piece of platinum wire changes with a change of its temperature. When once the manner in which this change takes place for a piece of platinum wire has been ascertained, it is only necessary to subject the wire to the temperature to be measured, as would be done with the bulb of a mercury thermometer when that kind of a thermometer is used, and then to measure its electrical resistance, in order to find out the temperature. H. L. Callendar showed that if we call ρt the platinum temperature, represented by the equation

$$\rho t = 100 \frac{R}{R_1 - R_0},$$

in which R = the resistance of the wire at that temperature ρt , R_1 = the resistance at 100° C. and R_0 = the resistance at 0° C., then the temperature on the air thermometer scale T could be represented by the equation

$$T = \rho t + \delta \left[\left(\frac{T}{100} \right)^3 - \frac{T}{100} \right].$$

In this equation, δ is a constant number for any one piece of platinum wire, but it would in general be different for another piece. This equation holds true with great accuracy for the range from 0° to 600° C. In order to find the value of δ for any particular thermometer, it is necessary to subject the thermometer to three different known temperatures, and measure its resistance at those temperatures. The temperatures selected are usually 0° , 100° , and the temperature of sulphur vapor at a pressure of 1 atmosphere, which is about 445° C. The work of Harker and Chappuis had the important purpose of comparing the scale of some of these platinum thermometers with the nitrogen thermometer of the International Bureau of Weights and Measures, which is, together with the hydrogen gas thermometer, a recognized international standard. During the course of this work the experimenters redetermined the boiling-point of sulphur on the constant volume nitrogen scale, and found it to be 445.27° . Callendar and Griffiths had previously found for the same temperature, expressed on the constant pressure air-thermometer scale, the value 444.53° , which is quite close for a measurement at that high temperature. The experimenters found that the differences between the platinum scale reduced by the formulæ given, and the constant volume nitrogen scale below 100° were exceedingly small. Even at the highest temperatures the differences amount to only a few tenths of a degree.—*Proc. Roy. Soc.*, 65, 327, 1899.

LIGHT.

Zeeman Effect.—Some progress was made during the year 1899 in increasing our knowledge of the Zeeman effect, a preliminary account of which was given in the YEAR BOOK for 1898. The accompanying diagram gives an idea of the normal Zeeman effect, together with some variations from it as observed in some cases by different observers. The facts about the Zeeman effect so far discovered are briefly as follows: (1) The displacement in any given spectral line is proportional to the magnetic field; (2) different lines in the spectrum of the same element and in different elements have in general different displacements in the same magnetic field. This displacement is not a simple function of the wave length; (3) many lines, instead of becoming triplets when viewed perpendicularly to the magnetic field, become quadruplets or sextets, etc.; (4) there appears to be an important connection between the displacement of a line and the posi-

	Normal	Cornu	Bequerel	Posidon	
Original	|	|	|	|	No polarization.
Viewed \perp to lines of force.	|	||	||	||	\perp } Polarized to the lines of force.
Along lines of force.	|	|	|	|	Right } Circularly polarized
	|	|	|	|	Left } Polarized

tion of the line to the magnetic field.

tion of the line in one of Kayser and Runge's series. On the simple theory of the Zeeman effect, if $\delta\lambda$ is the difference in wave length of the outside lines in the triplet, and if λ is the original unchanged wave length, e the negative electric charge on an ion, m the mass of the ion, H the strength of the magnetic field causing the Zeeman effect, v the velocity of light, and π the number 3.1416, it can be shown that

$$\frac{\delta\lambda}{\lambda^2} = \frac{e}{m} \cdot \frac{H}{2\pi v}$$

Calling $\frac{\delta\lambda}{\lambda^2}$ the displacement, this equation shows that the displacement, for the same value of the magnetic field, is proportional to the quantity $\frac{e}{m}$. As the displacement is different for different lines of the same element, it is evident that on this theory the quantity $\frac{e}{m}$ must be different for different lines. In regard to the Kayser and Runge series, spoken of above, it has been found, principally through the labors of Kayser and Runge, that many of the lines of the spectra of some of the elements, particularly of the first few of Mendeleef's groups of elements, can be arranged in definite series. Each line represents a particular wave length, of course. If, instead of considering the wave lengths, we consider the frequency, or wave numbers, which are proportional to the reciprocals of the wave lengths, Kayser and Runge found that the equation

$$\frac{1}{\lambda} = A + \frac{B}{n^2} + \frac{C}{n^4}$$

would represent the facts of the case for a great many lines. In this equation, λ is the wave length, A , B , and C are constants for one set of lines, and n is one of the ordinal numbers beginning with the number 3—that is to say, it is possible to find a series of lines whose wave lengths are given by the equation—the constants A , B , and C being the same for all the lines, the different values of λ for the different lines being given by substituting for n in the equation in succession the ordinal numbers 3, 4, 5, 6, etc. In the spectra of the elements sodium, potassium, rubidium, caesium, copper, silver, aluminium, indium, and thallium, two sets of lines can be found whose wave lengths are given by the equation, taking the same values for B and C for both sets, but taking A different—that is, the lines are found in pairs, with a constant difference in the wave numbers of corresponding lines of the pair. Two such sets together form what is called a series—that is, a series of pairs. All the elements mentioned have at least two of these series, and perhaps all other elements would also under suitable conditions. One of the series, called the first subordinate series, has strong but diffuse lines, while the second subordinate series has weaker but sharp lines. The alkali metals, the first four of those mentioned, have in addition a third series, called the principal series. The lines in the principal series are the strongest lines in the spectrum. In some case the series, instead of being composed of a number of pairs, is composed of a number of triplets. Now, in Kayser and Runge's formula, given above, all lines which have the same value of n may be called corresponding lines, unless they are members of the same pair or the same triplet in a series. So far as the investigation has gone up to the present time it seems to be a law that the displacement $\frac{\delta\lambda}{\lambda^2}$ has the same value for corresponding lines in the different series of the same element and even in different elements, and the lines are modified in the same way. As an example, consider the case of the three elements magnesium, cadmium, and zinc. Let us consider the second subordinate series in each element. These series are made up of triplets, each triplet corresponding to a certain value of n , B and C remaining the same, but A being different for the different lines of the triplet. Consider in each element the triplet corresponding to the value 3 of n . The following table, given by T. Preston, gives the wave length of the lines, the value of $\frac{\delta\lambda}{\lambda^2}$, which is proportional to $\frac{e}{m}$, and a statement of the character of the lines when they are modified by the magnetic field.

Magnesium.	Cadmium.	Zinc.	Displacement.	Character.
5183.8	5086.0	4810.7	18.0 approx.	Diffuse triplets.
5172.8	4800.0	4722.0	11.5	Quartets.
5167.5	4678.0	4680.0	10.0	Pure triplets.

The wave lengths are given in Angström units (10^{-10} metres). This relation at present is not very enlightening, it is true, but it is, no doubt, the first step in the way of unravelling some of the peculiarities of the Zeeman effect.

No satisfactory theory to explain these more complicated kinds of Zeeman effect has yet been put forward. Some writers, such as Stoney, Lorentz, Larmor, and Voigt, have shown that disturbing forces in addition to the magnetic force considered in the simple case were sufficient to cause the effects observed on the spectral lines—that is to say, they have produced equations which show the changes in the period actually observed—but there is no theory or explanation given as to what kind of a mechanical system is sufficient to show such effects when placed in a magnetic field. It amounts to having the equations without being able to interpret them in terms of the facts.—*T. Preston, Phil. Mag.*, 47, 165, 1899.

Becquerel Rays.—The new radiations recently discovered by H. Becquerel (see *YEAR BOOK*, 1898), and called after his name, and which are similar to the Roentgen rays in many of their properties, have been the occasion of recent interesting discoveries. Last year M. and Mme. P. Curie, by means of them, discovered two new elements in the mineral pitchblende, and called them polonium and radium, elements almost identical in many of their properties with bismuth and barium respectively. During this year, 1899, M. Debierne, working under the direction of M. and Mme. Curie, has discovered a third new substance, probably an element, whose chemical reactions are mostly like those of titanium, but whose radio-activity is 100,000 times greater than that of uranium.—*C. R.*, 129, 593, 1899.

Mme. S. Curie has continued her researches on the element radium, resembling barium in all its chemical compounds, and by taking advantage of slight differences of solubility, has obtained salts of the element which are pure enough to determine the atomic weight. The atomic weight of barium was determined at the same time and by the same method, and was found to be 137.8, which is close to the accepted value. The atomic weight of radium, however, is considerably larger, being 145.8. If the salts she used were not pure, it may be even larger than this. It was necessary, in order to isolate enough of the radium salt to experiment with, to work over half a ton of uranium residues from a factory. The compounds of radium have a greater radiating power for Becquerel rays several days after they are formed from precipitation than they have at first. This fact was also discovered by Giesel.—*C. R.*, 129, 760, 1899.

M. Eugene Demarçay has continued his observations of the spectrum given by the new radio-active compounds. He has found a number of new spectral lines belonging to the new element, of which the following are the strongest. The numbers represent the wave length in Angström units, 10^{-10} metres. 4826.3, 4683.0, 4340.6, 3814.7, 3649.6.—*C. R.*, 129, 716, 1899.

M. and Mme. P. Curie have also discovered the remarkable fact that a great many substances which are not radio-active themselves, if exposed to the radiations from radium compounds, become somewhat radio-active, this property lasting some time after they have been removed from the influence of the Becquerel rays. The substances tried were zinc, aluminium, brass, lead, platinum, bismuth, nickel, paper, barium carbonate, and bismuth sulphide. Curiously enough, all these substances seemed to have the property in about the same degree. The induced radio-activity decreases gradually, and two or three hours after the exposure it is reduced to one-tenth of its original value.—*C. R.*, 129, 714, 1899.

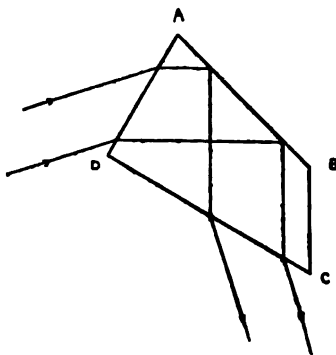
These Becquerel rays from the radium compounds also produce certain chemical effects. M. Demarçay discovered accidentally that they changed oxygen into ozone. M. and Mme. Curie also discovered that they produced a discoloration of glass. If a radium salt is placed in a glass flask, at the end of ten days the bottom of the flask is colored nearly black. When the coloration is not so intense, it is seen to be violet. The radiations also produce a brown coloration of barium-platino-cyanide. When this salt is first exposed to the Becquerel rays it becomes quite strongly fluorescent, but it gradually changes to a yellow, and then to a brown color, and at the same time becomes much less fluorescent. If the salt is exposed to sunlight, it turns white again, and regains its original fluorescent property. This same property was discovered by Villard in the case of Roentgen rays.—*C. R.*, 129, 823, 1899.

H. Becquerel experimented with a sample of radium chloride given him by M. and Mme. Curie, testing the phosphorescence of a number of bodies after they had been exposed to the radiations. He found that different bodies acted very differently under these radiations, and that by interposing different kinds of screens, which were partially transparent to the rays, he could get effects on the bodies which did not have the same relation to one another as when no screens were interposed. This shows that the radiations are not all of the same kind, but that, as in the case of light, there is a number of different kinds of radiations which are absorbed differently by different substances.—*C. R.*, 129, 912, 1899.

Becquerel also made some experiments as to the effect of a strong magnetic field on the Becquerel rays. He finds a very marked effect in the case of the radiations from the compounds of the element radium, but no visible effect in the case of the polonium compounds. Becquerel's experiments show some very curious effects, but

without going into a detailed description of them, it may be said that he decides from them that the radiations when in a magnetic field act in a manner very similar to that in which the cathode rays act under similar circumstances. The cathode rays, it will be remembered, are the rays produced in the inside of a Crookes's tube when an electric discharge is passed through it, and they are shot out from the cathode at right angles to its surface. The general opinion at present is that these cathode rays are particles of matter charged with negative electricity. If a charged particle of matter is moving in a magnetic field in a direction perpendicular to the lines of magnetic force, it is acted on by a mechanical force perpendicular to both the direction of its motion and to the lines of force. This force, of course, continually deforms its path, so that it will not be a straight line. The radium radiations in a magnetic field act as if they were such charged particles. Becquerel tried to get an observable deflection of these rays from radium in an electrostatic field, but was not able to do so. He says that if we consider a magnetic field to be similar to a medium possessing gyratory motion, and if we take some of his measurements made previously on rotary magnetic polarization, which give for the angular velocity of these vortices, $2\pi \times 6.6 \times 10^6$ per second, the velocity of the radiations from radium can be measured from the results of his experiments, and it is found to be of the same order of magnitude as the velocity found for the cathode rays. These results are very remarkable, and if they can be relied on, we have in them a peculiar case of cathode rays in air at ordinary pressure, and without there being any electric discharge of the ordinary kind through the air. Further experiments with these rays and the substances producing them cannot fail to be of great interest.—*C. R.*, 129, pp. 996 and 1205, 1899.

Spectroscope of Fixed Deviation.—MM. Ph. Pellin and A. Broca have devised a spectroscope of fixed deviation, as they term it, which may be a useful addition to the laboratory. In place of the usual 60° prism, they use one having angles like those represented in the diagram. The angles are, $A = 75^\circ$, $B = 135^\circ$, $C = 60^\circ$, and $D = 90^\circ$. The light enters at the face AD , is totally reflected from the face AB , and goes out at the face DC . The properties of this prism are such that every ray of light which falls on it at the angle of minimum deviation finally comes out at right angles to its original path. With such a prism on the spectroscope, all parts of the spectrum can be seen in the position of minimum deviation by simply revolving the prism. Several of these prisms can be combined in the most convenient manner, so that the collimator and telescope can have any angle that is a multiple of 90° .—*Journ. de Phys.*, 8, 314, 1899.



ELECTRICITY.

The Nature of Electrification.—To understand the possibility of ever getting an explanation of the nature of electrification, we must consider what an explanation really is. In physics and other sciences, an explanation is in effect a showing of what is not evident at first, that the thing explained belongs to a class of things already familiar, or at least to a class the individuals of which are alike in some respect, even though outwardly different. In this sense the atomic theory of matter and the kinetic theory of gases is an explanation. The kinetic theory of gases, for example, explains how the heat energy of a gas, which seems a thing of its own kind, is really a particular case of ordinary kinetic energy. The pressure of a gas is explained as really a particular case of a force produced by impact, in this case the constant force produced by the continual impact of an extremely large number of small particles. In this same sense we may hope to arrive at an explanation of electricity and of electrification. Our knowledge of electricity at present, so far as what may be called its engineering aspect, is very complete, as complete, in fact, as our knowledge of matter. There is a great deal still to be learned about electricity, and also about matter, but it cannot be said to be mysterious in the sense of a hundred years ago, or of ideas belonging intellectually to that period, when everything otherwise unexplained was "explained" by ascribing it to electricity or magnetism. It was doubtless in the hope of finding out something about the nature of electrification, and of the connection between matter and electricity, that guided the genius of J. J. Thomson, Cavendish professor of experimental physics in the University of Cambridge, England, to the study of the discharge of electricity through gases. His experiments have continued for many years, and at last he seems to be coming within sight of the goal, if it is possible to conceive of

there being an ultimate goal in science. It is impossible here to give more than an outline, necessarily incomplete, of the present state of the investigation, together with the recent most interesting and important discoveries.

One of the first facts discovered was that when a gas conducts electricity the process is quite similar to that which takes place when an electrolyte conducts. That is, some of the molecules of the gas are dissociated into two ions; to take a simple case, one of which is charged positively, and the other negatively. Ion is the name applied to such charged particles, which are not necessarily identical with atoms. When a gas with such ions in it is subjected to an electrostatic force, conduction takes place by means of the positive ions travelling in the direction of the force, and the negative ions in the opposite direction. In its normal state a gas is not ionized, and is not a conductor of electricity, but is, so far as we can tell, a perfect insulator. There are many different ways in which a gas may become ionized. The gases which come off from a flame, or from the electrodes when an electric current is passing through an electrolyte, or the gas in the neighborhood of a glowing platinum wire, or in the neighborhood of a polished metal plate on which ultra-violet light is falling, or a gas through which Roentgen or Becquerel rays are passing, or the gas near where electric sparks are passing, or near an electric arc—in all these cases the gas is ionized more or less. When a gas is ionized, it not only conducts electricity, but it affords facility for the condensation of water-vapor out of even an unsaturated state. If dust-free air, which has water-vapor in it, is suddenly expanded until it would be naturally supersaturated, if there are any ions present they form nuclei on which the water condenses in the form of a cloud. This effect would not take place with the same degree of expansion if there were no ions present. If electrified air is introduced into a vessel containing air that has a certain amount of water-vapor mixed with it, even if the water-vapor is not saturated, there is formed a cloudy condensation on the ions. Negative ions condense water on them more readily than the positive ions do. (See paragraph on Atmospheric Electricity.) The questions which J. J. Thomson's experimental skill has enabled him to solve are, What is the ratio between the charge of an ion and the mass of the ion? and finally, What is the actual charge, or the actual mass of an individual ion? Of course, a knowledge of the ratio of the charge to the mass together with a knowledge of the actual charge on each ion gives at once the mass of the ion.

Thomson first in 1897 made a measurement of the ratio $\frac{e}{m}$, e denoting the charge on an ion and m denoting the mass of the ion. He made this measurement in the case of the cathode rays, which are the rays found in a Crookes tube when an electric discharge is sent through it, and are believed to be streams of negatively electrified particles shot off from the cathode at right angles to its surface. His method of measuring the ratio depends on the fact that the path of the cathode rays, normally straight lines, becomes curved when they are subjected to a magnetic field. This curvature depends on the strength of the field, the velocity of the particles, and the ratio to be measured. A year later, in 1898, he succeeded in measuring the charge e contained on a single ion in the case of a gas ionized by the Roentgen rays. He made this measurement by taking advantage of the condensation of water-vapor on the ions in the form of a cloud in the manner to be described shortly. This year, 1899, however, he has succeeded in measuring the ratio $\frac{e}{m}$ and the charge e in the same case, which makes the results of much more value than the separate results heretofore had been. The measurements were made in the case of a polished zinc plate, negatively charged, on which ultraviolet was allowed to fall. The method of measuring $\frac{e}{m}$ was in brief the following. The zinc plate was placed in a gas at the low pressure of about .01 millimetre of mercury, because then the motions of the ions did not interfere with one another, the mean free path of the molecules being quite large. The zinc plate is charged with negative electricity, because only in this case do the ions get removed from the neighborhood of the plate. They are repelled and move away from it at right angles, under the influence of the electrostatic repulsion. He produced a magnetic field which was parallel to the surface of the plate. The effect of this was to make the charged particles move in cycloids instead of in straight lines perpendicular to the plate. The particles would move away from the plate for a while and then would move toward it again. He found by calculation that if he knew the strength of the electrostatic and of the magnetic field, and the greatest height of the cycloid above the plate, he could calculate the ratio $\frac{e}{m}$. He found the greatest height of the cycloid by placing near the zinc plate and parallel to it another perforated plate. When this was nearer to the zinc plate than the height of the curves, the ions continually carried electricity from the charged plate to the perforated one. When the perforated plate was moved farther away than the height of the cycloids, it ceased to receive any of the electricity. His experiments made in this way gave as a result a mean value for $\frac{e}{m}$ of 7.3×10^6 , in which e is measured in C. G. S.

electromagnetic units and m in grams. He had previously found for this ratio in the case of the cathode rays 5×10^6 . Lenard found for the case of the cathode rays 6.4×10^6 . Thomson next measured the charge on the individual ions. His method depended on the property of the ions by which they condense moisture out of the air. By allowing the air where the ions are to become nearly saturated with water-vapor and then suddenly expanding it, a cloudy condensation is produced. The cloud was allowed to settle, and the rate at which it fell was measured. From the rate of fall and the known viscosity of the gas, he calculated the diameter of each drop. From the amount of expansion he calculated how much water should be condensed per cubic centimetre, and combining this with the size of the drops, he deduced the number per cubic centimetre. This was the number of ions per cubic centimetre. He also measured the current produced in the gas by a known electromotive force, and from these, together with the velocity of the ions previously measured by Rutherford, he was enabled to deduce the value of e . His experiments gave a mean value of 6.8×10^{-10} in C. G. S. electrostatic units or 2.3×10^{-10} in electromagnetic units. For the ions produced by Roentgen rays he had previously found the value 6.5×10^{-10} . Townsend has shown that this charge is the same as that on the hydrogen ion in electrolysis. The charge e being the same as in electrolysis, if the mass m were also the same the ratio $\frac{e}{m}$ would be the same. But the ratio $\frac{e}{m}$ is not the same. For the hydrogen ion it is about 9600 in electrolysis, using electromagnetic units and grams, in round numbers say 10^4 . Therefore the mass of the ion in the case of the ionized gas is smaller than the hydrogen ion in electrolysis by the factor 1.4×10^{-3} . This is a remarkable result, as the hydrogen atom, which, when charged, becomes the ion in electrolysis, is the smallest portion of matter that we have previously had any experience of. It brings J. J. Thomson to his new working hypothesis as to the nature of electrification in the case of a gas, or, indeed, of matter in any condition. Quoting mostly his own words, he regards the atom as containing a large number of smaller bodies which he calls corpuscles. These corpuscles are equal to each other, and the mass of a corpuscle is the mass of a negative ion in a gas at low pressure—that is, it is about 3×10^{-24} grams. In the normal atom this assemblage of corpuscles forms a system which is electrically neutral. Electrification of a gas is the splitting up of some of the atoms, resulting in the detachment of a corpuscle from some of the atoms. The detached corpuscles behave like negative ions, each carrying a constant negative charge which he calls for brevity the unit charge. The part of the atom left behind behaves like a positive ion with a unit positive charge, and a mass large compared with that of the negative ion. The corpuscles are the vehicles by which electricity is carried from one atom to another. We are thus led to the conclusion that the mass of an atom is not invariable. The amount by which it may vary depends on the charge of electricity it can receive. So far as we know, the greatest charge an atom may receive is the unit charge multiplied by the valency of the atom. It is probable in the case of a gas ionized by Roentgen or Becquerel rays, that not more than one corpuscle becomes detached from a single atom. It does not follow, however, that there may not be more corpuscles left behind which could be detached by more powerful means. In the case of the Zeeman effect, the ratio of the charge to the mass is of the same order as in the case of an ionized gas. If there were only one or two corpuscles in the atom it would be expected that only one or two lines in the spectrum would show the Zeeman effect. As there is, however, in most cases a considerable number of lines which show the Zeeman effect, it may be concluded that there is a considerable number of corpuscles in the atom giving the spectrum.

If these views of J. J. Thomson become finally accepted, and prove themselves able to meet all the criticism that will be made, there is no doubt that they will mark an epoch in our knowledge of the nature of electricity and of the connection between electricity and matter. It is for this reason that so much space has been devoted to them here.—J. J. Thomson, *Discharge of Electricity through Gases*, New York, 1898; *Phil. Mag.*, 46, 528, 1898, and 48, 547, 1899.

Wehnelt Interrupter.—The Wehnelt interrupter, or electrolytic break, is a device which has occasioned considerable interest during the past year. It is named after its inventor, A. Wehnelt, of Charlottenburg, Germany. It is a device for rapidly breaking and making again an electric current, and its principal use is in connection with the primary circuit of an induction coil. The induction, or Ruhmkorff coil, consists of two coils of insulated wire, a short coil of coarse wire and a long coil of fine wire, wound around the same core of iron wire in the form of a spool, the coarse wire being inside. When a current in the primary circuit, which is the short coarse wire, is suddenly broken, an induced current is suddenly produced in the secondary circuit, and this current has an enormous electromotive force so that it will spark across an air gap. The more frequently the primary circuit is broken,

the more frequently the spark in the secondary is obtained. The more suddenly the primary is broken, the greater the electromotive force of the secondary, and the greater distance will the spark leap across the spark gap. The means heretofore used for breaking the primary circuit have been purely mechanical. The Wehnelt interrupter is very simple, and consists of an electrolytic cell inserted in the circuit, one electrode, usually the cathode, being quite large, and the other one, the anode, being quite small. This arrangement brings about a great current density at the anode and a great production of heat. Little bubbles of gas and steam are continually being formed, which break the circuit for a moment, and then collapsing, or moving away, allow it to be continued again. In contrast with the old mechanical breaks, which gives only a few breaks per second, the Wehnelt interrupter will give so many as to make a musical note, in some cases as many as 2200 per second. This gives a note not far from the C two octaves above the middle C of the piano. The effect of this on the spark gap of the secondary circuit is quite remarkable. The sparks succeed each other so rapidly as to make an arc which looks like a thread of flame. The best electrolyte to use for the purpose, as Wehnelt found, after trying a good many, is sulphuric acid of a density 1.16 to 1.2. A lead plate may be used for the large cathode, but for the small anode it is necessary to use platinum wire. All other metals are too rapidly disintegrated. The platinum wire used for the small anode is usually introduced into the electrolyte through a glass tube, out of which it projects for a short distance. The gases produced at the large electrode are those usually produced in the case of electrolysis, but this is not the case at the small anode. At the anode, when sulphuric acid is used for the electrolyte, there is produced an explosive mixture of oxygen and hydrogen, instead of oxygen alone, as might be expected. In order to operate the interrupter, it is necessary to have a voltage not less than 12 volts, and it works better with considerably greater. As the voltage is increased, the frequency of the interruptions becomes greater. Decreasing the self-induction of the circuit also has the same effect. When the temperature of the cell is increased above 70° C. it does not work so well. The sparks in the secondary of the induction coil becomes shorter. Wehnelt made a study of the current curve, which shows how it varies with the time, and he found that it decreased almost instantaneously to zero when the break was made. It immediately, however, increases again, but at a much slower rate, to its maximum value, and then breaks again, and so on. The current curve is changed a little by the presence of the secondary when the interrupter is placed in the primary circuit of an induction coil.

Various forms of the interrupter have been constructed, but the main principle is the same—that is, to have a large current density at one electrode and a small current density at the other. The interrupter enables induction coils to give out much longer sparks than they are constructed to give. For use with Roentgen ray tubes, if the electrodes are large enough to stand the current the interrupter is very valuable, as with it a Roentgen ray photograph can be obtained in a fraction of a second. It is also of great use in getting the spark spectra of substances. It can also be used with an induction coil in the preparation of ozone. On account of the extremely rapid sparking produced in the secondary by its means, the interrupter can be used to make some striking and interesting experiments which illustrate the heating effect of the electric spark, and the effect of a magnetic field on it.—*Wied. Ann.*, 68, 233, 1899.

Atmospheric Electricity.—In this subject there is still a great deal to learn, but a certain amount of light has been thrown on parts of it during the year. Atmospheric electricity includes, of course, lightning and the aurora borealis, but atmospheric potential is the phenomenon most usually considered under the name, probably because it is easier to investigate than the others. The electric potential at any point in the air, like the electric potential anywhere, is measured numerically by the amount of mechanical work that would be necessary to move a unit positive charge of electricity from the earth to that point against the force of electric repulsion. A positively charged body repels another positively charged body, and therefore it takes mechanical work to move a unit positive charge from the earth toward any positively charged body. In moving the charge in this way against the force of repulsion it is moved into positions of continually higher and higher potential. It is possible by means of appropriate instruments to determine the potential of points in the atmosphere that can be reached by our instruments. In clear weather points above the ground are usually at a higher potential than the ground itself, and the potential increases with the distance from the ground. This fact indicates that the surface of the earth at such times has a negative charge, while somewhere above the surface of the earth there is a positive charge. Until recently there was no information as to where this positive charge was, whether on the other heavenly bodies or in the upper layers of the atmosphere. Recent experiments by Bornstein, Baschin, and Cadet in balloons have shown that the potential at a height

greater than 1000 metres does not increase at so rapid a rate, the rate of increase apparently growing smaller and smaller. This indicates that some at least of the positive charge is distributed in those parts of the atmosphere.

There is on the average a somewhat regular variation of the atmospheric potential on clear days. Chauveau has investigated a number of records of meteorological observatories in which the atmospheric potential has been observed continuously, and has come to certain conclusions, which will doubtless help in time to explain the origin of atmospheric potential. He finds that on clear days when there are no accidental circumstances to disturb the indications there are two kinds of curves formed, one of which is characteristic of summer and the other of winter. In summer, at stations near the ground, and at all times at stations in the tropics, there are two maxima and two minima each day. The maxima come at 7 to 9 A.M. and 6 to 8 P.M. The minima come at about 4 A.M. and 3 P.M. In winter, on the other hand, the afternoon minimum becomes faint and disappears, while the early morning minimum becomes of comparatively much greater importance. These curves can be shown from the records of the Central Meteorological Bureau in Paris. At the top of the Eiffel Tower, only a few hundred metres distant from the bureau, the curves of summer show a great analogy to those of winter at stations near the ground. Chauveau concludes that an influence of the soil, the principal factor of which, he thinks, is the evaporation of water-vapor, comes in as a perturbing cause in hot weather. The general law, which comes out clearly at the elevated stations in all seasons, and at all stations in the winter time, is a simple oscillation, with a maximum in the daytime and a minimum between 3:30 and 4:30 in the early morning.

Another discovery, made by C. T. R. Wilson, and communicated to the Royal Society of London in June, 1899, is that negatively charged ions condense water on them more readily than do positively charged ions. (See paragraph on the Nature of Electrification.) Dust-free air, saturated with water-vapor, according to Wilson's experiments, must expand in the ratio 1.25, in order to make the water condense on negative ions, while it must expand in the much greater ratio, 1.31, in order to make the water condense on the positive ions. In the first case, the supersaturation is fourfold and in the latter case it is nearly sixfold. If, then, it should happen that in the upper regions of the atmosphere there were free ions charged with both kinds of electricity, the condensation of water would take place more readily on the negative ions, drops of rain would be charged negatively, and the negative charge would be brought to the ground with the rain. The continual effect of rain at various parts of the earth's surface would thus be to charge it negatively, leaving the corresponding positive charge in the air. Mr. Wilson was not able to obtain any very sure evidence that there are free ions in the air at all times, and this part of the subject, he says, needs further investigation.—*Chauveau, C. R.*, 129, 500, 1899; *Wilson, Proc. Roy. Soc.*, 65, 289, 1899.

Pellat has performed some experiments, the complete account of which is not yet accessible, which show, he thinks, that when water evaporates from a surface charged with electricity some of the charge goes off with the water-vapor. As many observers in the past have tried the same experiment, with contradictory results, this point, perhaps, cannot yet be looked on as satisfactorily settled. These experiments of Pellat are what suggested to Chauveau that it might be the evaporation of water from the ground that caused the daily variation of atmospheric potential.—*Pellat, C. R.*, 128, 169, 1899.

Electromotive Force of the Clark Cell.—A new absolute determination of the electromotive force of the Clark cell has been made by Professor H. S. Carhart and Dr. K. E. Guthe at the University of Michigan. The Clark cell is a cell made up in a very careful and particular way with pure chemicals, and it is used as a practical laboratory standard of electromotive force. It has zinc and mercury electrodes, immersed in a solution of zinc sulphate. The determination referred to was a sequel to the work of Patterson and Guthe in making an absolute determination of the ampère, treated in 1898 YEAR BOOK. In the previous work an electro-dynamometer was constructed, by means of which the absolute value of an electric current could be measured. Ohm's law gives the relation between current, electromotive force, and resistance as

$$\text{Current} = \frac{\text{Electromotive force}}{\text{Resistance}},$$

so that an electromotive force at the extremities of a wire of known resistance can be measured if we can measure the current which is produced by the electromotive force. The experimenters used the electro-dynamometer to measure their currents, and they compared their resistances with two standard 1-ohm coils made by Wolff, of Berlin, and compared at the Reichanstalt. Two Clark cells were made in accordance with the specifications legalized by act of Congress in 1894. They were of the H-form, as modified by Kahle. The electromotive force of a Clark cell at 15° C.

is 1.4333 volts. This value depends on the value of the ampère as found by Patterson and Guthe. One of these cells was afterward compared with those at the Reichanstalt, at Charlottenburg, Germany, and found not to differ more than $\frac{1}{10000}$ from the mean of all the normal Clark cells in the Reichanstalt. Messrs. Glazebrook and Skinner, using a different value for the electrochemical equivalent of silver (.001118) and a different method of using the silver voltameter, found in 1892 the value, 1.4342 volts at 15° C. This value would, however, become 1.4332 if allowance were made for the difference in the electrochemical equivalent of silver and the difference in the method of using the silver voltameter. The difference in the use of the silver voltameter depends on the fact that, according to Kahle, the silver equivalent for a solution neutralized with silver oxide is $\frac{1}{10000}$ higher than for one not neutralized.—*Phys. Rev.*, 9, 288, 1899.

ASTROPHYSICS.

Pole Star a Triple System.—W. W. Campbell, working at the Lick Observatory with the Mills spectograph, has discovered that the pole star, α *Ursæ Minoris*, has a variable velocity in the line of sight. Measurements of the velocity of a star in the line of sight are made by observing in the spectrum of the star whether or not there is a displacement of those spectral lines which come from known substances, and therefore have a known wave length—that is, a definite known position in the spectrum. These determinations are made by Döpler's principle, according to which if a luminous body is approaching the eye of the observer, the waves of light reach the eye more frequently, and as a consequence the wave length is shorter than it would be if the luminous body were at rest. On the other hand, if the luminous body is receding from the observer, the waves are longer. This change in the wave length can be detected only with the spectroscope, of course. In the case of sound a similar phenomenon is observed, and this is plainly noticeable to the ear. If one is in a rapidly moving train, it will be noticed that the sound of a bell on a locomotive approaching from the opposite direction has its pitch considerably lowered at the instant of passing, when it ceases to approach the ear and begins to move away. Campbell's observations were made during August, 1899, and show that Polaris has a velocity in the line of sight toward the earth varying from 8.6 kilometres per second to 14.6 kilometres per second. This gives a range of 6 kilometres per second. The period of the change is about 3 days 23 hours. Some previous observations made in 1896 did not happen to show a sufficient variation to make the variable velocity apparent. The observations happened to be taken at intervals apart, which were multiples of the period of the variation, as shown in 1899. The velocity found at that time, however, was about 19.6 kilometres per second. Campbell, therefore, thinks that there is another disturbing force, and instead of Polaris being a binary system, as the 1899 observations alone give evidence of, that it is really at least a triple system.

Atmosphere of Venus.—H. N. Russell has made some observations at Princeton, N. J., which throw some light on the nature of the atmosphere of the planet Venus. When Venus, which is nearer to the sun than the earth is, reaches a position where it is nearly on the straight line joining the sun and earth, it has, of course, an appearance similar to that of the new moon. It shows a very thin crescent. If Venus had no atmosphere, it would be easy to calculate how much of her illuminated surface we ought to be able to see in any given position of the planet with reference to the sun. But the effect of an atmosphere which refracts the light entering it is to increase a little, not only the amount of surface which is illuminated by the sun, but also the amount of surface which is visible. The effect of these two causes is to make the cusps of the crescent extend around farther than they otherwise would. By measuring them an idea can, therefore, apparently be obtained of the amount of refraction in the atmosphere of Venus, and thus of the density of the atmosphere and its height. Regarded in this way, the atmosphere should be twice as dense as that of the earth. But Russell shows that if the atmosphere is perfectly transparent and is as dense as this, the appearance of the rim of light when Venus is still nearer to the sun, and the cusps meet, ought to be very different. It ought to be 2000 times as bright as it really is. Any fog or mist in the atmosphere would lessen this, but a hazy atmosphere of itself would tend to extend the cusps without considering any refraction. Russell shows that if we consider the effect of both refraction and of haze, we have no satisfactory evidence that the atmosphere of Venus is more than one-third as dense as that of the earth.—*Astroph. J.*, 9, 284, 1899.

ABBREVIATIONS USED IN REFERENCES.

In each reference the numbers following the name of the journal indicate usually in succession the volume, the page, and the year.

Ann. Ch. Ph. *Annales de Chimie et de Physique*.

Astroph. J. *Astrophysical Journal*.

C. R. *Comptes Rendus*, of the Paris Academy of Sciences.
Elect. *The Electrician*, London.
Journ. de Ph. *Journal de Physique*.
Phil. Mag. *London, Edinburgh, and Dublin Philosophical Magazine*.
Phys. Rev. *Physical Review*.
Proc. Roy. Soc. *Proceedings of the Royal Society of London*.
Wied. Ann. *Annalen der Physik und Chemie*.

PHYSIOLOGICAL SOCIETY, AMERICAN, organized in 1887, in 1899 had 73 members; meets annually in December. President, R. H. Chittenden, Ph.D.; secretary, Frederic S. Lee, Ph.D., Columbia University, New York City. The society publishes the *American Journal of Physiology*.

PICKING, HENRY F., rear-admiral, U.S.N., died September 8, 1899. He was born in Somerset County, Penn., in January, 1840. Appointed to the navy when seventeen years of age, he served at the academy in Annapolis from 1857 to 1861. and in July of the latter year was appointed acting master. A year later he was made a lieutenant. During the Civil War he was in the blockading service; among the engagements he witnessed were the sinking of the privateer *Petrel*, the fight with the Confederate ram *Merrimac*, and a number of skirmishes with the batteries on Sullivan's Island. After the war his promotions were as follows: Lieutenant-commander, July, 1866; commander, January, 1875; captain, August, 1880; commodore, November, 1898; rear-admiral, March 3, 1899. On the 25th of that month he was ordered to the command of the navy yard at Boston.

PICQUART, GEORGES, one of the leading witnesses for Dreyfus at the second court-martial, was born at Strasburg in 1854. After receiving his education at St. Cyr and at the general staff school, he served with the Zouaves in Algeria, and then entered the infantry. In 1880 he became captain, and in 1883 was appointed to the war office staff. From 1885 till 1888 he served in Tonquin, where he gained a decoration, and, returning to France, became professor at the military school. In 1893 he was again appointed to the war office, and in 1895 was placed at the head of the intelligence department. In 1896 he was made lieutenant-colonel, and began his investigations upon the Dreyfus case. This ultimately led to his being sent in disgrace to Tunis in 1897, but he was sent for during 1897-98 to take part in the legal proceedings. His evidence was of great importance; but in February, 1898, he was prosecuted for revealing war office secrets. Colonel Picquart was released after a long imprisonment, and was one of Dreyfus's most important witnesses during the trial at Rennes. See FRANCE (paragraphs on History).

PIERCE, HENRY NILES, D.D., LL.D., Protestant Episcopal bishop of the diocese of Arkansas, died at Fayetteville in that State, September 5, 1899. He was born at Pawtucket, R. I., October 19, 1820; was graduated at Brown University in 1842, and six years later took deacon's orders in the Episcopal Church. The following year he was ordained to the priesthood, and until 1852 was engaged in missionary work in Washington County, Tex. During the next two years he had a regular charge at Matagorda, Tex.; he then became rector of Trinity Church, New Orleans; subsequently he held the following charges: St. Paul's, Rahway, N. J., 1855-57; St. John's, Mobile, Ala., 1857-68; St. Paul's, Springfield, Ill., 1868-70. In the last-named year he was consecrated bishop of Arkansas and Indian Territory, and in 1871, upon the erection of Arkansas into a diocese, he was made its diocesan, still retaining control of the Indian Territory mission. Besides several volumes of sermons and addresses, Bishop Pierce wrote *The Agnostic, and Other Poems*.

PIERPONT, FRANCIS H., ex-governor of Virginia, died in Pittsburg, Penn., March 24, 1899, in his eighty-fifth year. He was born in Monongalia County, Va. (now West Virginia). In boyhood he was able to get only little schooling, but he later succeeded in entering college. He taught school, studied law, and finally, having been admitted to the bar, settled in Fairmont, Marion County. He rose to prominence, and at the outbreak of the war declared himself loyal to the Union. From June, 1861, to June, 1863, he was governor of Virginia at Wheeling; from the latter date to May, 1865, at Alexandria; and from May, 1865, to January, 1868, at Richmond. After the war he rendered valuable services in the reorganization of Virginia and the formation of the new State of West Virginia.

PILLSBURY, CHARLES ALFRED, the well-known miller, died September 17, 1899, at Minneapolis, Minn. He founded in 1872 the firm of Charles A. Pillsbury and Company, which built the largest flour mills in the world. The plant was sold in 1889 to an English syndicate, which also bought other mills, organizing the Pillsbury-Washburn Flour Mills Company, of which Mr. Pillsbury became president. He was also president of the Minneapolis and Northern Elevator Company, owning elevators through the northwestern grain region. Mr. Pillsbury was born in New Hampshire, 1842, and was graduated at Dartmouth. In 1872 the Pillsbury firm was

founded, and thereafter were built the many fine buildings and improved machinery of the present plant. Improvement in the crushing and disintegration of the wheat brought about by the introduction of steam rollers, made a cheaper and greatly improved quality of flour, and from the monopoly of the patent for some years Mr. Pillsbury reaped great profit. Outside of the milling and elevator business, Mr. Pillsbury served, 1877-87, as a Minnesota State senator, representing the Republican party.

PINGREE, HAZEN S., governor of Michigan, was prominent in 1899 through his continued efforts to bring about the municipal ownership of street railways in Detroit. (See MICHIGAN, paragraph Detroit Street Railways.) He was born at Denmark, Me., August 30, 1840. In youth he worked on his father's farm, in a cotton factory at Saco, and in a shoe factory at Hopkinton, Mass. On August 1, 1862, he entered the Union service as a private in the First Massachusetts Heavy Artillery, with which he remained until August 15, 1865, except for about five months in 1864, when he was a prisoner of war. After being mustered out he went to Detroit and worked in a shoe factory until 1866, when with a partner he established a small factory, which has become one of the largest shoe-manufacturing enterprises in the West. As mayor of Detroit, to which position he was elected four times, serving from 1889 to 1896, he became widely known for establishing potato gardens on vacant city lots, cultivated by the otherwise unemployed, and for his hostility to street railway and other combinations. He was elected governor in 1896, as a Republican, and was re-elected in 1898.

PIPE LINES. See IRRIGATION and WATER-WORKS.

PLAGUE. At the commencement of the year 1899 the scourge that has devastated India since the autumn of 1896, and China and Persia for nearly as long a period, and Japan for a shorter time, was reported to be progressing with rapid strides. In localities where the disease had apparently subsided a recrudescence occurred. In the Bombay Presidency, India, for the week ending January 13, 1899, there were 2593 cases of the disorder registered, with 2045 deaths. Throughout the entire Presidency 360 villages were infected at this date; and up to this time, from the commencement of the epidemic in September, 1896, there had been, in the Bombay Presidency alone, 214,197 cases, with 169,240 deaths. In midsummer there was reported in Poona, India, an alarming condition. During the two days, July 29 and 30, 360 cases occurred, and 317 deaths were reported. At this time the disease was reported at Bangalore, also at Bushire, Persia. Early in August it appeared at Alexandria, Egypt, where a large proportion of the cases were fatal. In Hong Kong, at this time, there seemed to be a decrease, the figures reported in August being about 30 cases a week, against 100 a week a fortnight previous. Mauritius reported 52 cases of the plague, with a mortality of 37 in August. In Marseilles at this juncture about 2 new cases a week were reported. In September the reports from Poona showed an increased mortality, reaching 1000 a week from all causes, plague being responsible for nearly all of these. The disease had also reappeared in Hyderabad, in Scinde, in a very virulent form. In Bombay there were from 60 to 80 new cases a week, in Calcutta from 30 to 40 a week. During the year ending September 1 the following had been the figures in Mysore province alone: Bangalore City, 3377 cases, with 2787 deaths; the cantonment, 4040 cases and 3330 deaths; the district, 5347 cases and 4746 deaths; Mysore City, 2759 cases and 2238 deaths; the district, 956 cases and 704 deaths; the Kodar district and gold fields, 2303 cases and 1823 deaths. Other places brought the total for the Mysore district up to 19,840 cases and 16,320 deaths. For the first week in November the record was bad. In India the total deaths for this week reached 6727, of which Bombay Presidency contributed 5812. In the Nizam's dominions 592 deaths were reported. Tidings from Saran in Bengal bring intelligence of a large number of deaths there. Six cases were found in Hoshiarpur, Punjab. Lord Curzon, Viceroy of India, made a personal inspection of the plague hospitals and segregation camps in Poona, during November. His enthusiastic advocacy of inoculation with plague serum as a preventive, and the example set by himself and his party (all of whom were inoculated before leaving Simla) were of great value in preventing panic and encouraging proper measures for protection.

The first case of plague to reach England in 1899 was in the person of a man on board of the steamer *Golconda*, from Calcutta via Ceylon and Marseilles, who suffered from a mild attack of the scourge, and was put ashore at Plymouth. He had been infected through clothing brought aboard by a convalescent from the disease. On October 14 the *Peninsular*, of the P. and O. Steamship Company, brought to Plymouth a coal trimmer suffering from plague which was contracted at Bombay, and appeared sixteen days later, when the steamer reached Marseilles. Several cases of the disease were seen at Naples and Palermo in August, three or four ending fatally. In August, Drs. Mendoza and Vincente were sent from Spain to Oporto, Portugal, to study the plague there. Surgeon Fairfax Irwin, of the United States

Marine Hospital Service, was also ordered to Oporto for the same purpose. It is said that this city was infected by a steamer loaded with rice from India. A commission was appointed by the French government to investigate the epidemic of the plague in Portugal, including Dr. Albert Calmette, Director of the Pasteur Institute at Lille, and Dr. Salimbeni, preparateur in the laboratory of Dr. Roux, Pasteur Institute, Paris. The Portuguese government authorized the distribution of the anti-plague serum of the Pasteur Institute. Spain, Italy, and Turkey sent in requests for this serum, and it was supplied from Paris. A request from the Boers was declined, as the reserve supply in the Pasteur Institute had become nearly exhausted. It is now generally recognized that antiplague serum is of undoubted efficacy as a prophylactic, though less certain as a curative.

The plague reached New York harbor on November 18, on board the steamer *J. W. Taylor* from Santos, Brazil. The steamer left Santos October 24, the man was taken ill November 1, and died November 5. The captain and the cook were both suffering with the disease when the quarantine authorities boarded the vessel, and were removed to the fever hospital in the lower bay. The ship was thoroughly and repeatedly fumigated. The 24,000 bags of coffee which formed the cargo of the *Taylor* were taken out upon lighters and exposed to the air for eight days. While the health officer of the port, Dr. Doty, and Health Commissioner Jenkins, formerly health officer, agreed that the cargo could be landed with perfect safety to the city after the precautions named, the other commissioners of health thought otherwise and for some weeks the fate of \$600,000 worth of coffee was uncertain. After Boston offered to take the cargo it was deemed safe to land it in New York City, and finally it was put ashore. As a special precaution to allay public fear, as well as to increase the safeguards now surrounding the public health of the city, Dr. Doty issued in November the following statement: "Thereafter all vessels arriving from Santos, whether there is infectious disease among the crew or not, will be subjected to the same precautions. The cargo will be fumigated in the hold and then discharged into lighters and held in the open air for eight days from the time of removal. The vessel, after discharge of cargo, will be kept under the supervision of the health officer and loaded in the stream before sailing." No case of the disease appeared in any part of New York City.

In December the fell disease appeared in Honolulu, Hawaiian Islands. Two deaths occurred from this cause on December 12, and 2 cases were reported in Honolulu on December 20. The infection is thought to have been brought from Japan on a Norwegian steamer. A slight doubt exists as to the genuineness of the disease in Honolulu.

Dr. Yersin thus describes a typical case of plague: The disease is ushered in with a chill followed by a high temperature (39° to 41°C). Dizziness and staggering gait follow, with headache and lassitude. Injection of the conjunctivæ, rapid breathing, frequent pulse, vomiting, and constipation supervene. The bubo appears in the groin, armpit or neck during the first hours of the disease. It is always painful to the touch. The second day the temperature remains elevated, the respiration anxious and the pulse more frequent. At this time the bubo is as large as a pigeon's egg, and the patient begins to be delirious. The third day the pulse reaches 140 in frequency, the patient is suffering agony and the bubo is the size of a hen's egg. Death usually occurs on the fourth day, the proximate cause being paralysis of the respiratory centre.

The pathological controversy between Drs. Kitasato and Yersin has been ended by the acceptance by the former of the theory of Yersin that the plague bacilli are found only in the lymphatics. Kitasato's earlier experiments were made upon patients in the latter stages of the disease or dead patients, at a time when putrefaction of the blood had set in, and the Kitasato bacilli were found in the blood-vessels. Hence his conclusion that the pest-bacillus must have its origin in the blood-vessels. Kitasato's recent examinations in Kobe led him to conclude that the pest-bacilli propagate in the lymphatic vessels, next cause putrefaction of the blood, followed by fever, prostration, and lung inflammation, the Kitasato bacilli being present in the blood-vessels only in the last stages. He agrees that the Yersin bacillus is the true cause of plague. See INSECTS AND THE PROPAGATION OF DISEASE.

PLANETOIDS. See ASTRONOMICAL PROGRESS.

PLANT, HENRY BRADLEY, founder of the well-known Plant system of railways and steamships, died in New York, June 23, 1899. He was born in Branford, Conn., October 27, 1819, and was educated privately and in the public schools. In 1837 he entered the services of the New Haven Steamboat Company, and later was placed in charge of the express business on the New York and New Haven steamboats, and on the New York and New Haven Railroad. Having subsequently entered the employ of the Adams Express Company, he was appointed in the fall of 1854 superintendent of the Southern Division, with headquarters at Augusta, Ga. He held this position

until 1861, when he organized the Southern Express Company, and became its president, which he continued to be until the time of his death. During the war he rendered invaluable services to the Confederates by his energy in effecting transportation. After the war the Southern Express did much toward re-establishing the cotton industry, by affording means for the transportation of the cotton to the factories. Still later, Plant in becoming connected with a large system of railroads contributed largely to the industrial growth of the South. To him also was due the opening up of Florida as a winter resort. The steamship lines that came under Plant's control are a line between Tampa and Key West, the Canada, Atlantic, and Plant Steamship Company, Limited (between Boston and Halifax), and the North Atlantic line of steamers. At the time of his death Plant was a trustee of the Metropolitan Trust Company, a director of the Key West Commercial Company, a trustee of the American Surety Company, and president of the following: The Lake Alfred Company, the Alabama Midland Railway Company, the Brunswick and Western Railroad Company, the Savannah, Florida and Western Railroad Company, the Charleston and Savannah Railway Company, the Tampa and Thonotosassa Railroad Company, and the Silver Springs, Ocala and Gulf Railroad Company. Plant never entered politics. It will be remembered that, as an evidence of the appreciation of him in the South, Monday, October 28, was designated Plant System Day at the Atlanta Exposition of 1895, where Plant had erected a building for an exhibit of his system of railways and steamships.

PLATINUM. The production of platinum for the last two years was, 1897, 150 ounces, value, \$900; 1898, 225 ounces, \$3375. Trinity and Shasta Counties in California still continue to be the sources of supply.

J. M. Davison has discovered the existence of both platinum and iridium in the meteoric irons from Coahuila and Toluca.

PLAYFAIR. Sir ROBERT LAMBERT, died February 18, 1899. He was born at St. Andrews, Scotland, March 21, 1828; was educated at St. Andrews University, and in 1846 entered the Madras Royal Artillery; appointed consul-general in Algeria in 1867, and in 1885 his consular powers were extended over Tunis. He wrote: *Fishes of Zanzibar*; *History of Arabia Felix*, 1859; *Travels in the Footsteps of Bruce in Algeria and Tunis*, 1877; *The Scourge of Christendom*, 1884; *Bibliography of the Barbary States—Algeria, Cyrenaica, Morocco*, 1888 *et seq.*; (Murray's) *Handbook to the Mediterranean*, 1892, and *Handbook to Algeria and Tunis*, 1895.

PLAYGROUNDS. See PARKS.

PNEUMONIA. See SERUM THERAPY.

POLE STAR. See ASTRONOMICAL PROGRESS AND PHYSICS.

POLITICAL AND SOCIAL SCIENCE, AMERICAN ACADEMY OF, in Philadelphia, was founded in 1889. President, Edmund J. James, University of Chicago; secretary, L. S. Rowe, University of Pennsylvania. It issues the *Annals*, a bi-monthly publication.

POLO was introduced into England in 1872 by British cavalry officers, who learned the game in India, where it has been played in some form for many years. The game has recently become very popular in the United States. There were in 1899 over a score of prominent clubs, formed wholly or in part for the pursuit of the game, and several hundred players registered in active play. Polo, which may be described as hockey on horseback, has a sufficient spice of danger to attract the stronger class of sportsmen. It is an expensive game also, involving stables of well-bred ponies and carefully laid-out grounds. One of the most notable polo events of 1899 was the opening of the new courses laid out by George J. Gould at Lakewood, N. J. In 1899 the height of ponies allowable for match plays was raised from 14.1 hands to 14.2 hands. The tournaments held throughout the United States are under the auspices of the Polo Association, with headquarters at No. 15 Church Street, New York City. The grand annual championships for the Astor Gold Cup have been held in the past at Prospect Park, New York City, being won by the Myopia (Mass.) Hunt Club in 1895, the Rockaway (Long Island, N. Y.) Club in 1896, and the Meadow Brook (Long Island) Club in 1897 and 1898. In 1899 there was no tournament, owing to the death of Mr. Vanderbilt. Nearly all the clubs held important tournaments in various parts of the country, the meets of all kinds in 1899 being over 75. On the Pacific coast a North California team defeated a South California team by 9 goals to 1. Among leading Eastern teams in 1899 were those of the Westchester (Newport) Club, made up, during most of the season, of J. M. and Lawrence Waterbury, John E. Cowdin, and Foxhall Keene; the Meadow Brook four, W. C. Eustis, C. C. Baldwin, H. P. Whitney, and Benjamin Nicoll; the Myopia team, H. P. Gardner, R. L. Agassiz, R. G. Shaw, 2d, and H. H. Holmes,

and the Lakewood organization, including such players as George J. Gould, H. L. Herbert, chairman of the Polo Association and the "father of polo"; P. F. Collier, the well-known master of fox-hounds, and others. Among the noticeable younger players are C. R. Snowden, George W. Kendrick, 3d, Charles Wheeler, and George McFadden, of the Devon (Penn.) Club, who won the Valentine, Alden, Morrell, and Cedarhurst challenge cups in the first half of the season, against all comers. For the junior players cups are offered by Mr. Gould, and the Juvenile Polo Cup, W. H. Hazard donor, to be played for annually. The junior players are becoming more numerous, and promise to develop many strong players for the future. Four teams played at Rockaway, Long Island, for the Juvenile Cup. Team No. 1, made up of René La Montagne, Jr., Louis Neilson, and Halstead Vanderpoel, beat Team No. 4 in the finals by $5\frac{3}{4}$ goals to $2\frac{1}{2}$, after defeating No. 2 by 6 to 4. Team 4 had beaten Team 3 by $4\frac{3}{4}$ to 4. Polo is not so well known at large as it should be, and the above review is not a complete record. Some of the statistics are from *Outing*. The following are the principal polo organizations: Buffalo Country Club, N. Y.; Country Club of Westchester, N. Y.; Dedham Polo Club, Mass.; Devon Polo Club, Penn.; Jacksonville Polo Club, Fla.; Lakewood Polo Club, N. J.; Meadow Brook Club, N. Y.; Morris County Country Club, N. J.; Myopia Hunt Club, Mass.; Onwenstia Club, Ill.; Philadelphia Country Club, Penn.; Point Judith Country Club, R. I.; Rockaway Hunting Club, Long Island, N. Y.; Somerset County Polo Club, N. J.; Southampton Polo Club, Long Island, N. Y.; St. Louis Country Club, Mo.; Staten Island Polo Club, N. Y.; The Brookline Country Club, Mass.; Westchester Polo Club, Newport, R. I.; Washington Polo Club, D. C.; Saratoga Polo Club, N. Y., and Aiken Polo Club, S. C. Also the Atlantic City Country Club, N. J., with polo grounds laid out late in 1899. It is expected that a number of prominent American polo players will compete at Paris in 1900. They may also visit England and endeavor to recapture the Challenge Cup, won at Newport, R. I., in 1886, by the Hurlingham Club, of London.

POLO, WATER. See SWIMMING.

PONAPÉ. See CAROLINE ISLANDS.

POND, GEORGE EDWARD, editorial writer on the staff of the *New York Sun*, died at Spring Lake, N. J., September 22, 1899. He was born in Boston, Mass., March 11, 1837; was graduated at Harvard in 1858 and at the Harvard Law School in 1860. After practising law for two years, he entered the Union service as a first lieutenant, and in 1864 resigned to become associate editor of the *New York Army and Navy Journal*. From 1868 to 1870 he was a member of the editorial staff of the *New York Times*, and then was editor-in-chief of the *Philadelphia Record* from 1870 until 1877, when that paper became the property of William M. Singerly. Returning to New York, Pond resumed his position with the *Army and Navy Journal*, and at the same time was associated with the editorial staff of the *Galaxy Magazine*. With the latter he remained for ten years, and wrote the well-known *Driftwood Essays* over the pen name Philip Quilibet. Later he accepted an editorial position on the *Sun*, which he retained to the time of his death. He wrote *The Shenandoah Valley in 1864*, and in collaboration with William Swinton, *Twelve Decisive Battles*. He was a member of the Authors' Club.

PONISI, MILE., at one time a well-known actress, died at Washington, February 19, 1899. She was best remembered as a successful actress of old-woman parts, and played particularly long and well in the old comedies. She first appeared in New York in 1850 as Lady Teazle. In the seventies she became noted for her impersonation of Mrs. Hardcastle in *She Stoops to Conquer*. Beginning in 1871, she played for many years with the old Wallack stock company, New York. At the later Wallack's, on the present theatre site, she was conspicuous in most of the old comedy revivals. Ponisi was born in England about 1819, and had lived a retired life for ten years or more.

POOL. The world's championship at continuous pool, held in 1898 by J. R. Keogh, Scranton, Penn., was captured at Chicago, April 10-12, 1899, in a match between Keogh and Alfred De Oro, New York. The championship conditions are: 600 balls, 200 each night. The totals were: De Oro, 600; Keogh, 515. In a subsequent match for the championship, held in New York, November 30 to December 2, De Oro won, by the same score, over F. J. Dayton, of Omaha, Neb., whose total was 479.

POPE, CHARLES R., died July 2, 1899. He was first known in this country as an actor in Shakespearean plays, playing with Booth, the elder Salvini, and others; about 1874 he abandoned the stage to become a manager of various theatrical enterprises, particularly in New Orleans and St. Louis. In the latter city he built Pope's Theatre, which was one of the well-known playhouses of the West until replaced by a new theatre in 1895. He retired from business in 1887, afterward

serving as consul at Toronto under President Harrison. He was sixty-seven years old, and was born in Germany.

PORTO RICO. See PUERTO RICO.

PORTRAIT GALLERY, NATIONAL (British), established in 1856, is in a building in St. Martin's Place, London, which was first opened in 1896, as the gift of W. H. Alexander to the British nation. There are over 1200 portraits and busts in the gallery. It is open to visitors, free, on Mondays, Wednesdays, and Fridays. Secretary, Mr. Lionel Cust, F.S.A.

PORTUGAL, a European kingdom, situated on the western coast of the Iberian peninsula, bounded on the east by Spain and on the west by the Atlantic Ocean. The area, including the Azores and the island of Madeira, is 36,038 square miles, and the population in 1890 (the latest available statistics), 5,082,257. The chief towns are Lisbon (population, 301,206) and Oporto (population, 138,860). The state religion is the Roman Catholic, while other religions are tolerated. The number of emigrants to the United States in the fiscal year 1898-99 from Portugal, including Cape Verde and the Azores, was 2054, showing an increase of 337 over the previous year. Education is not general, the number of illiterates being very large, in 1890, 79 per cent. The revenue, according to the budget of 1899, is 52,373,581 milreis, coming largely from direct taxes, and the expenditures, 53,919,296 milreis, of which the greatest item is the consolidated debt, next coming the civil list and the cortes. All men of 21 years are obliged to serve in the army, which, according to the reorganization of 1899, on a peace footing consists of 30,000 men, and on a war footing of about 150,000 men. The Portuguese navy amounts to very little, but has a few good vessels. In 1899 the *Donna Amelia*, a cruiser of 1660 tons, was launched at Lisbon. Another new vessel is the *Admostor*. Three vessels building in 1899 were the *Don Carlos I.*, 4100 tons, with a speed of 20 knots, and 2 15-knot cruisers, the *Sao Gabriel* and *Sao Rafael*, of 1800 tons each. The chief productions are maize, rye, wheat, and, the most important, wine. There are large productions also of olive oil, figs, oranges, potatoes, etc. The most important mineral productions are copper and sulphur ore, lead, antimony, and manganese also being found. The exports are chiefly agricultural, wine being by far the most important. The value of exports to the United States for the year 1899 was \$3,774,642, and that of the imports from the United States was \$5,113,524; the total importations for consumption were valued in 1897 at \$43,660,016, and the total exports at \$29,504,810. The unit of currency is the milreis, which has a value of \$1.08. The colonies of Portugal comprise Gôa, on the Malabar coast; Damão, on the coast, 100 miles north of Bombay; and Diu, a small island west of Damão (the production is principally salt); Macao, at the mouth of the Canton River, China; a part of the island Timor, in the Malay peninsula; the Cape Verde Islands, with 1480 square miles and 114,130 inhabitants; Portuguese Guinea, on the coast of Senegambia (4440 square miles; population, 820,000); the islands of St. Thomé and Principe in the Gulf of Guinea; Angola, on the west coast of Africa (484,800 square miles; population, 4,119,000); and Portuguese East Africa (301,000 square miles; population, 3,120,000). The government is a constitutional monarchy, under the King, Carlos I.

History, 1899.—The bubonic plague was brought to Oporto in July, as was supposed, by means of merchandise received from Bombay. In October nearly 140 cases and 44 deaths had been reported. The ignorance of the populace led them to the belief that the physicians were causing the disease, and the work of the latter was thereby much impeded. Efforts to confine the disease within the city were ineffectual. A reciprocity convention between the United States and Portugal was proclaimed in 1899, which provided for a reduction of duties on wines, brandies, and paintings coming to the United States, and a minimum rate on all flour, except wheat flour, agricultural machinery, tar and pitch, etc., going to Portugal.

PORTUGUESE GUINEA, on the western coast of Africa, is a small colony entirely surrounded by French possessions on the land side, the colony of French Guinea to the south and Senegal to the north merging to enclose it on the rear. Portuguese Guinea has an area of about 4440 square miles. It includes the adjacent archipelago of Bijagoz, with the island of Bolama, on which the capital town, Bolama, is situated. The chief port, Bissau, lies upon the northern part of the coast. The population is about 820,000. The chief products for export are rubber, wax, oil seeds, ivory, and hides. In 1898-99 the estimated revenue of the colony was 72,280 milreis, and the expenditure was 180,854 milreis.

POTATOES. The following table, published by the department of agriculture, division of statistics, shows the acreage, production, and value of potatoes in the United States in 1899:

States and Territories.	Acreage.	Average Yield per Acre.	Production.	Average Farm Price per Bushel Dec. 1.	Farm Value Dec. 1.
	<i>Acres.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Cents.</i>	<i>Dollars.</i>
Maine.....	46,865	129	6,054,235	42	2,735,979
New Hampshire.....	18,662	127	2,370,074	46	1,090,294
Vermont.....	24,915	123	3,063,780	36	1,133,951
Massachusetts.....	23,065	124	3,760,710	57	2,143,615
Rhode Island.....	7,212	143	1,024,104	50	512,052
Connecticut.....	25,562	130	3,323,060	46	1,528,628
New York.....	326,327	88	28,707,976	40	11,483,190
New Jersey.....	47,955	88	4,200,265	51	2,099,935
Pennsylvania.....	179,339	85	15,243,515	43	6,554,840
Delaware.....	5,239	52	272,426	51	136,938
Maryland.....	22,193	64	1,420,352	56	794,280
Virginia.....	36,515	66	2,409,990	56	1,348,594
North Carolina.....	16,398	57	925,701	66	612,943
South Carolina.....	4,141	56	231,586	104	241,172
Georgia.....	5,594	46	257,524	53	135,734
Florida.....	1,704	69	117,576	124	145,794
Alabama.....	5,997	56	335,532	67	222,174
Mississippi.....	5,812	61	354,032	102	330,513
Louisiana.....	7,947	60	476,520	81	384,284
Texas.....	14,499	64	927,986	91	844,622
Arkansas.....	23,146	63	1,773,196	71	1,258,971
Tennessee.....	25,806	44	1,135,464	65	738,052
West Virginia.....	37,122	73	2,722,784	52	1,399,548
Kentucky.....	89,710	51	4,525,310	61	2,755,378
Ohio.....	162,048	71	11,505,033	43	4,947,173
Michigan.....	173,185	66	11,480,810	33	3,637,667
Indiana.....	108,062	76	8,214,232	43	3,538,120
Illinois.....	163,002	96	15,648,192	41	6,415,799
Wisconsin.....	156,337	102	16,102,711	36	4,198,705
Minnesota.....	113,423	96	10,983,606	35	3,792,152
Iowa.....	193,478	100	19,347,800	23	4,564,894
Missouri.....	105,512	83	8,767,496	40	3,502,986
Kansas.....	99,646	95	9,466,370	45	4,259,696
Nebraska.....	143,560	94	13,494,640	27	3,673,660
South Dakota.....	56,925	78	4,440,150	27	1,193,640
North Dakota.....	29,854	103	3,074,902	37	1,139,340
Montana.....	4,597	141	648,177	53	343,534
Wyoming.....	3,770	125	471,250	61	287,462
Colorado.....	32,304	84	2,713,836	55	1,492,445
New Mexico.....	734	49	35,966	68	24,457
Utah.....	5,446	130	658,520	55	352,426
Nevada.....	1,771	102	180,642	90	162,573
Idaho.....	4,790	124	593,960	61	362,216
Washington.....	15,397	144	2,217,168	50	1,108,584
Oregon.....	14,984	115	1,717,410	49	841,531
California.....	26,543	119	3,158,617	63	1,998,829
United States.....	2,581,358	86.6	228,783,222	59	99,226,622

POULETT, Sixth Earl, **WILLIAM HENRY POULETT**, died January 22, 1899. He was born in London, September 22, 1827, and was educated at the Royal Military College at Sandhurst, being graduated in 1842. He served in India from 1852 to 1857, engaging in 1853 in the expedition from Peshawur to Boroe Valley. He succeeded his uncle, the fifth Earl, to the title in 1864. Subsequent to his service in the army much of his time was passed in hunting and other sports. At the time of his death the right of succession to the title was in dispute between the Earl's son by his third wife and the Viscount Hinten, a son of his first wife, but whose paternity the Earl disclaimed.

PRESBYTERIAN CHURCH IN ENGLAND in 1899 had 314 organized congregations and 16 preaching stations, 328 ministers, and accommodation for 162,000 communicants. It has 20 ordained and 12 medical missionaries, 3 missionary teachers, and 25 women missionaries. The Westminster College was opened in Cambridge in October, 1899. General secretary, Rev. J. Thoburn McGaw, D.D., 7 East India Avenue, Leadenhall Street, E. C., London, England.

PRESBYTERIAN CHURCH IN THE UNITED STATES (NORTH). During 1899 Presbyterian churches in certain quarters are said to have experienced some depression in spiritual matters, which also was manifest in other denominations. Although debt was removed from the home and foreign mission boards, it was felt that active measures must be taken for the spiritual uplifting of the church. The last general assembly adopted the following deliverances on Fundamental Doctrine: "The truthfulness of the Scriptures, the freedom from liability to error of our Lord Jesus Christ, the personal establishment by Christ of the Lord's Supper, and the justification of sinners by imputing to them the merits of Jesus Christ received by faith alone." These deliverances are considered to be a firm basis of agreement

of all the different bodies of the church. A careful statistical inquiry into the numerical relation between ministers and churches showed that there was a lack of ministers. "The Presbyterian and Reformed churches in all countries had in 1899, 26,467 ministers, 136,509 elders, 4,842,534 communicants, and 3,473,764 Sabbath-school scholars." The Presbyterian Church in the United States (North), in 1899 had 7175 ministers, 7386 churches, and 961,334 communicants. There are twelve divisions of the Presbyterian Church in the United States. Besides the Northern church, above mentioned, there are the Presbyterian in the United States (South), the Cumberland Presbyterian, the Cumberland Presbyterian (colored), the Welsh Calvinistic, the United Presbyterian, the Associate Church of North America, the Associate Reformed Synod of the South, the Reformed Presbyterian in the United States (Synod), the Reformed Presbyterian in North America (General Synod), the Reformed Presbyterian (Covenanted), and the Reformed Presbyterian in the United States and Canada. The latest report of the United States Commissioner of Education shows that the Presbyterian bodies have 53 institutions of learning, with 457 professors, 4352 students, and endowment funds aggregating \$5,085,053.

PRESBYTERIAN CHURCH IN THE UNITED STATES (SOUTH) reports, for 1899, a ministerial body of 1471, with 2919 churches and 221,022 communicants. No great spiritual movement took place in the church during the year, but a call for \$200,000 for foreign missions was made as a twentieth century offering. The Southwestern Presbyterian University, at Clarksville, Tenn., received a gift of \$100,000, and a chapel was given to the Union Theological Seminary at Richmond, Va. Buildings and grounds in Austin, Tex., have been donated for a theological seminary.

PRESS CLUBS, INTERNATIONAL LEAGUE OF, founded in 1890, had in 1899 a membership of 4000. President, Colonel J. M. Carter, Jr., Baltimore; secretary, C. Frank Reed, Boston Press Club, Boston, Mass.

PREVENTION OF CRUELTY TO ANIMALS, AMERICAN SOCIETY FOR THE, incorporated in 1866, and supported chiefly by voluntary contributions, maintains an extensive humane work in New York City. The report of the society for the year 1899 shows 417 arrests and prosecutions, 3756 animals suspended from labor, 3240 horses, mules, and other large animals disabled past recovery and humanely destroyed, 85,895 small animals destroyed; 493 disabled horses and other large animals removed from the streets in ambulances, and 57,958 cases investigated. The society distributes humane literature and conducts courses of illustrated lectures in schools and before gatherings of livery men, wagon-drivers, and others. The efforts of the society have also during the year 1899 been directed to the protection of animals in Cuba, Puerto Rico, Hawaii, and the Philippines. President, John P. Haines; superintendent, Charles H. Hankinson. Headquarters, Madison Avenue and Twenty-sixth Street, New York City.

PREVENTION OF CRUELTY TO ANIMALS, THE MASSACHUSETTS SOCIETY FOR, incorporated in 1868, with same purposes as the above, has organized over 41,200 "bands of mercy" for the protection of harmless animals, and publishes *Our Dumb Animals*. President, George T. Angell, 19 Milk Street, Boston, Mass.

PREVENTION OF CRUELTY TO CHILDREN, NEW YORK SOCIETY FOR THE, founded in 1874, the parent of many similar societies in the United States. The twenty-fifth annual report of the society (for the year 1899) shows that since the foundation of the society 129,675 complaints were received, 50,800 cases were prosecuted, 47,455 convictions were secured, and 83,986 children were rescued. In the year 1899, the convictions numbered 2913, and 5637 children were rescued. Headquarters, 297 Fourth Avenue, New York City. President, Elbridge T. Gerry; secretary and superintendent, E. Fellows Jenkins.

PRICE, Major Sir ROSE LAMBERT, English soldier and writer, died April 17, 1899. He was born July 26, 1837; was educated at Grosvenor College, Bath. He entered the army and served with rank of lieutenant on the East African coast, for the suppression of slavery; he then served in India during the Mutiny; in 1857 was a member of the storming party at the capture of Canton; was wounded in the capture of the Pei Ho forts; participated in the taking of Tangku and the Taku forts; and was present at the surrender of Peking, where he was honored with a medal and three clasps. He wrote *The Two Americas* and *A Summer on the Rockies*, 1868.

PRIMITIVE METHODISTS, or RANTERS, founded in 1810, have three conferences, 65 ministers, 72 churches, 6470 members, and property worth \$433,300. The headquarters are at Fall River, in which part of Massachusetts the denomination is chiefly located.

PRINCE EDWARD ISLAND, a province of the Dominion of Canada, with a gross area of 2000 square miles; capital, Charlottetown.

Agriculture.—In the calendar year 1898 the yield of wheat was 596,761 bushels; oats, 2,922,552; barley, 147,880; buckwheat, 84,460; potatoes, 7,071,308; turnips, 2,005,453; grass and clover seed, 12,417; pease, 4735; corn, 2651; and beans, 2495. Live stock comprised 30,000 horses, 14,060 colts and fillies, 55,017 milch cows, 55,014 other cattle, 176,800 sheep, and 51,100 swine.

Fisheries.—The value of all fishery catch in the calendar year 1897 (the last officially reported) was \$954,949, a decrease in a year of \$21,177, and the lowest since 1899. The principal catches were lobsters, \$493,336; herring, \$116,144; oysters, \$83,660; cod, \$82,083; hake, \$33,115; mackerel, \$31,570, and smelts, \$29,927. Exports of all fisheries in 1898 amounted to \$510,298, an increase in a year of \$16,017, and the capital investment in all fisheries, \$386,156.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise aggregated in value \$486,681, almost wholly for home consumption; exports, domestic and foreign, \$1,389,674, an increase in a year of \$75,067; duty collected, \$136,705. Navigation was facilitated by 39 light-stations, 66 light-houses, and 5 warning apparatus. The registered merchant marine of the province comprised 21 steamers of 4043 gross tonnage, and 157 sailing vessels of 11,936 tonnage.

Banks.—On January 1, 1899, there were 6 chartered banks and branch banks in the province; 9 post-office savings banks, with 1356 depositors, and \$308,046; and a government savings bank, with 5361 depositors, and \$1,843,961 deposits.

Railways and Post-offices.—The Prince Edward Island Railway, one of the two railways built and owned by the Dominion government, extends the entire length of the island, 154½ miles, and, including branches, had a total length in 1898 of 211 miles. Its total earnings in the year were \$158,951; total expenses, \$231,419; deficit, \$72,468; government expenditure for all purposes, \$248,961, and paid-up capital, \$3,768,107. At the end of 1898 there were 409 post-offices in the province, in which were posted during the year 1,350,000 letters and 198,000 postal-cards, and 17 money-order offices, which issued 9903 orders.

Education.—Reports for the school year of 1898 showed 581 school districts, 468 schools, 581 teachers, 21,852 enrolled pupils, 13,377 pupils in average daily attendance, and total expenditures of \$163,033, of which \$129,818 was from the government, and \$33,215 from the school board.

Finances.—The revenue of the province in the year ending December 31, 1898, was \$276,183; expenditure, \$301,700; gross debt, \$468,757; Dominion government debt allowance, \$181,953; other assets and net debt for the year, not reported. Charlottetown had a net debt of \$141,500, and total assessment of \$2,652,193.

Population.—Local estimates in 1898 gave Charlottetown, 12,500, and Summerside, 2500. The Indian population of the province was 314. There was one school for Indian youth, with an enrolment of 32 pupils. The Indians cultivated 256 acres of land, and received \$9160 from their various industries.

PRINCETON UNIVERSITY, at Princeton, N. J., is now in its one hundred and fifty-third year. Among its new buildings are two dormitories, the Albert B. Dod Hall and the David Brown Hall, both gifts of Mrs. David Brown, of Princeton, recently erected. Another handsome building lately finished is Alexander Hall, the gift of Mrs. Charles B. Alexander, to be used for commencement exercises and all academic gatherings. The Isabella McCosh Infirmary has been completed and is now open. A building to be used for indoor tennis, and for occasional entertainments, has been erected by contributions from the undergraduates and their friends; a large and complete library building and a new dormitory, called Blair Hall, in honor of its donor, Hon. John I. Blair, have been recently finished. A new dormitory, to be called Stafford Little Hall, in honor of its donor, Hon. H. S. Little, of the class of 1844, is now being erected. Mr. Little also gave to the university the sum of \$10,000 for the establishment of a lectureship on public affairs, the Hon. Grover Cleveland, LL.D., being the lecturer. The university has 106 endowed scholarships for the benefit of students in the Academic Department, one of which may be assigned to a student in the School of Science. At the commencement, June, 1899, degrees were conferred in course upon 2 Doctors of Philosophy, 1 Doctor of Science, 34 Masters of Arts, 127 Bachelors of Arts, 4 Electrical Engineers, 49 Bachelors of Science, and 9 Civil Engineers. For Statistics, see **UNIVERSITIES AND COLLEGES**.

PRISON ASSOCIATION OF NEW YORK, organized in 1846 to ameliorate the condition of prisoners, to improve prison discipline, and for the support and encouragement of reformed convicts; inspects all State, county, and city penal institutions annually, and reports to the legislature. During the last year the society registered 756 discharged prisoners, provided 651 with steady work, and furnished 5800 books to libraries of county jails and penitentiaries. President, Charlton T. Lewis; corresponding secretary, W. M. F. Round, 135 East Fifteenth Street, New York City.

PRODIGY, AN ARITHMETICAL. See GRIFFITH, ARTHUR F.

PROTECTIVE TARIFF LEAGUE, AMERICAN, organized in 1895. In 1899 it had 967 members. Secretary, Wilbur F. Wakeman, 135 East Twenty-third Street, New York City. The general meeting for 1900 is on January 18, at New York City.

PROTESTANT EPISCOPAL CHURCH. The event arousing most popular interest during 1899 was the ordination of Dr. Charles A. Briggs (*q. v.*) by Bishop Potter, of New York. This act aroused not a little bitter opposition on the part of a number of clergymen, who subsequently tried to induce the convention of New York to censure the bishop and the standing committee of the diocese. The admission of Dr. Briggs was followed by the resignation of Dr. De Costa, a noted Episcopalian clergyman. The next triennial general convention will be held in 1901. The latest report of the United States commissioner of education shows that the Protestant Episcopal Church has 5 institutions of higher education, with 60 professors, 503 students, and endowment funds aggregating \$1,645,467. The Protestant Episcopal Church reports 59 dioceses, 17 missionary districts, 84 bishops, 4734 priests and deacons, 6519 parishes and missions, 699,582 communicants, and contributions amounting to \$13,878,380.

PRUSSIA, THE KINGDOM OF, is the largest political division of Germany. Its area is 134,603 square miles, or over 64 per cent. of the country, and its population, according to recent estimates, is 35,000,000, or 66 per cent. of the inhabitants of Germany. A large proportion of the population is engaged in agriculture and mining, and the trade and industries of Prussia are of great importance. Prussia contains Berlin, the capital of the empire, with a population of 1,677,304. Among the cities are Breslau, Cologne, Frankfurt, Magdeburg, Hanover, and other well-known towns. There are ten celebrated universities in Prussia. The kingdom is represented in the German *Bundesrath* by 17 members, and in the *Reichstag* by 236 deputies. The king is the German emperor. Local government is vested in the king and the *Landtag*, consisting of a house of lords and a chamber of deputies. The principal minerals are coal, of which Prussia produces over 84,000,000 tons annually, or 90 per cent. of the total German output; zinc, of which Prussia yields about one-half of the world's production; copper, and lead. Other statistics may be found in the article *GERMANY*.

PSEUDO-INFLUENZA. During 1899 there have been many cases reported of disease whose clinical symptoms resemble those of epidemic influenza (*la grippe*). Bacteriological examination of sputa in each case has resulted in the discovery of the absence of Pfeiffer's bacillus, which is the cause of influenza, and the presence, in most cases, of the streptococcus bacillus. Many of these cases prove to be cases of pneumonia, and in a number of these beside the streptococci are found diplococci. The deduction has been that there are morbid agents which are capable of producing a condition resembling influenza besides the bacillus of Pfeiffer. Von Jaksch has had special studies made of all the cases of pneumonia at his clinic in Vienna since the appearance of the plague in that city. In November and December of last year diplococci were found in the sputa of these cases; during February and March, 1899, or about the time the pseudo-influenza was prevalent, several streptococcus pneumonias were observed. In all these cases the streptococci were highly virulent.

PSYCHICAL RESEARCH, the investigation of those alleged mental and physical manifestations ordinarily ignored in the laboratories of experimental psychology (*q. v.*), and by alienists, such as apparitions, thought-transference, hypnotism, clairvoyance, "haunted" houses, dreams, coincidences, and allied phenomena. Most of the research in these fields has been done by the Society for Psychical Research, founded in England in 1882 (president for 1899, Sir William Crookes, F.R.S., membership, 924), and its American branch (secretary and treasurer, Dr. Richard Hodgson, membership, 1899, 502). A most substantial article by Miss Johnson, of Newnham College, Cambridge, England, on *Coincidences*, was published during the year. Perhaps the most interesting investigation by the society in the year 1899 was a continuation of the research into the trance phenomena of the well-known medium, Mrs. Piper. Professor J. H. Hyslop, vice-president and secretary of the New York section of the American branch of the society, is making a detailed report of his inquiries into the trance phenomena of this medium, to be published in 1900. In illustration of the correct identification of personality in these trance "messages," Professor Hyslop also carried out in 1899 an interesting and valuable research as to what circumstances are sufficient to compel the recognition of another personality when this latter is manifested solely through verbal messages expressed either by letter or telegraph, and representing incidents in the common life of communicator and receiver.

Given, therefore, the automatic writing or speech of an entranced medium, the question naturally arises, before one can believe or not in the reality of spirits, whether the "communications" are of such a nature that they can reasonably be thought to represent the characteristics and experiences of a certain specific personality. The independent reality of this person or personality is a separate problem. Professor Hyslop thought to demonstrate the possibility of recognizing these trance

personalities by showing that it would be easy for one living individual to recognize another solely by means of verbal communications having the trivial and incoherent style of messages received through Mrs. Piper. He performed the following experiment:

The person who was to represent the supposed spirit selected a number of incidents common to the life of the receiver, starting from the most general and proceeding to the most specific. These were written out, some of them in the incoherent style of trance communications, and presented or telegraphed, one at a time, to the receiver, who was to guess as soon as possible the identity of the other. This guess was easily and correctly made in the majority of the cases and the results are held by Professor Hyslop to show that the identification of personality can be established on perhaps a hundredfold less evidence than is presented in the Piper records. It may be mentioned as an illustration of the experiments referred to that one was performed with the communicator in New York City and the receiver at a distance of one hundred miles from that city. This was arranged in such a way that the receiver had not the slightest suggestion of whence the messages came, these having been sent to a third person. The identity of the communicator was correctly guessed at the end of the seventh out of twenty messages, each consisting of ten or fifteen words representing about fifteen or twenty incidents of a more or less general or specific character, arranged in an order of increasing definiteness. Professor Hyslop considers that the results of this successful guessing show how few are the incidents necessary to enable one person to recognize the identity of another with surety. This is considered as strengthening the Piper case by demonstrating both that a positive and correct identification of personality after a few messages is possible, and that incoherences, grammatical and mental, of the trance messages are not an argument against the spirit hypothesis.

PSYCHICAL RESEARCH, THE SOCIETY FOR. See **PSYCHICAL RESEARCH.**

PSYCHOLOGICAL ASSOCIATION, AMERICAN, founded in 1892, had a membership, 1899, of 128. The eighth annual meeting was held at Yale University, New Haven, Conn., December 27-29, 1899. The president for 1900 is Professor Joseph Jastrow, of the University of Wisconsin; secretary and treasurer, Livingston Farrand, Columbia University. The association consists of two sections, an experimental section and a philosophical section. In the experimental section at the last meeting new psychological instruments were exhibited, and papers were read and discussions were held on the following subjects: *Volition as a Scientific Datum*, by Professor E. F. Buchner, of New York University; *The Criterion of Sensation*, by Professor G. S. Fullerton, of the University of Pennsylvania; *Moral Perceptions of School Children*, by W. S. Monroe, of the State Normal School, Westfield, Mass.; *Psychology and Social Practice*, by Professor John Dewey, of the University of Chicago; *Individual Tests of School Children*, by E. A. Kirkpatrick, of Fitchburg Normal School, Mass.; *A New Arithmetical Prodigy and His Methods*, by Professors E. H. Lindley and W. L. Bryan, of Indiana University (see GRIFFITH, ARTHUR F.); *Researches in Experimental Phonetics*, by Dr. E. W. Scripture, of the Yale psychological laboratory; *Elements of a Psychological Theory of Music*, by Dr. Max Meyer; *On Relations of Time and Space in Vision*, by Professor Cattell, of Columbia (see **PSYCHOLOGY, EXPERIMENTAL**); *Conditions Affecting the Judgment of the Direction of Lines*, by Professor E. B. Delabarre, of Brown University (see **PSYCHOLOGY, EXPERIMENTAL**).

PSYCHOLOGY. The science of the mind and of mental manifestation in all their possible modes of expression. Psychology has in the last twenty years become more of a natural science and less of a theory by the application of the natural science methods of research to the old theoretical problems of mind. This method is followed out in that branch of psychology at one time known as psycho-physics, but now generally called experimental psychology. (For the world's progress during 1899 in this line see the article **PSYCHOLOGY, EXPERIMENTAL**.) The scope of psychology has gradually widened so as to embrace not only the adult, human, normal mind, but every possible deviation therefrom. An "animal psychology" investigates the apparent mental life of various animate things (cp. Kline, *Methods of Animal Psychology*, *Am. Jour. Psy.*, 10, 256, and, for example, Small, *The Psychic Development of the Young White Rat*, *ib.*, 11, 80). The experimental psychologists do not stop with the higher orders of animals, but have even investigated mind in some of the lowest forms of animal life (cp. Jennings, *The Psychology of a Protozoan*, *Am. Jour. Psy.*, 10, 503). A child psychology has swept over the United States, and has been taken up in various countries of Europe, both by workers in the laboratories and by child study associations, whose membership, consisting largely of teachers, prosecute these researches in the schools, with results that make for improvement in methods of primary and secondary education. An

important contribution to child psychology is made by Dr. Arthur MacDonald, specialist in the United States Bureau of Education, in his article *Experimental Study of Children* in the report of the commissioner of education for 1897-98 (published in 1899. See Vol. I., pp. 989-1204, and Vol. II., pp. 1281-1390. See also Carman, *Pain and Strength Measurements of 1507 School Children*, *Am. Jour. Psy.*, 10, 392; and Colegrove, *Individual Memories*, *ib.*, 10, 228). Great progress is being made year by year in the field of abnormal psychology. Problems in this field are not only those relating to the various forms and degrees of insanity, but also the forms of mentality studied by the societies for psychical research (*q. v.*). A considerable literature is appearing, too, upon the psychology of sex, chiefly abnormal, in Germany, Italy, and England. It is thus seen that the old limitations of psychology are breaking down, and that our knowledge of the mental processes of the normal human adult is being supplemented by extensive study of the abnormal, the animal, and the adolescent. Specialization in the narrower field of normal human adult psychology has gone to the greatest extremes, so that we have not only researches in the senses of sight and hearing (see the *American Journal of Psychology*, the *Psychological Review*, *Zeitschrift für Psychologie*, and several other psychological periodicals), but researches upon smell (Zwaardemaker, *Tasten Smaakgewaarwordingen bij het Ruiken*, touch and taste sensations in smell, *Nederlandsche Tijdschrift voor Geneeskunde*, 1, 4, 1899), upon touch, the muscular sense, the time sense, and upon taste. W. Sternberg, in an article, *Geschmack und Chemismus* (taste and chemical action), in Vol. XX. of the *Zeitschrift*, above mentioned, finds that the only tastes, strictly speaking, are sweet and bitter, but that all the other so-called tastes are compounds of taste and touch. Bitter tastes produce hunger, and sweet tastes cause thirst. The molecules of sweet substances are very similar to those of bitter substances. This fact explains why the sensations are so often closely associated, and proves that the organ of taste is extremely delicate. The study of the psychology of reading is being carried to an elaborate refinement (see *PSYCHOLOGY, EXPERIMENTAL; PSYCHOLOGY OF READING*), and more attention is paid yearly to the investigation of problems connected with the influence of mind upon body, as is seen in the various forms of suggestion (*q. v.*)—namely, hypnotism, psycho-therapeutics, and various other forms of faith cure, mind cure, etc. See *CHRISTIAN SCIENCE*.

Psychology in Europe.—The work of the laboratories of experimental psychology in Europe was divided in lines of the closest specialization, as follows: In the only laboratory in England connected with a university—namely, that of the university at Cambridge, the director, Dr. W. H. R. Rivers, reported the completion and publication of researches upon the development of the senses of the natives of Torres Strait (between Australia and Papua), including work upon their reaction time, musical capacity, intuition of time, mental fatigue, and effects of practice. These researches were undertaken as part of the work of the Cambridge anthropological expedition to Torres Strait. At the meeting of the British Association Dr. Rivers reported that the natives show considerable variability in temperament, and are not particularly susceptible to suggestion. He tested 150 natives of Torres Strait and Kiwai for color blindness, and found no case. The color names of the islanders were investigated. They were found to have definite names for red, less definite for yellow and green, while for blue they had to borrow names from English. A corresponding bluntness of vision for the violet end of the spectrum was observed. The results of numerous investigations into their ability to draw and write showed the natives to have a surprising accuracy in mirror writing. Their estimation of time was found to be unexpectedly exact. Indications of mental fatigue were shown by them, also the improvement due to practice. In hearing they were below the average Europeans, and in acuteness of sense of smell not above; but they had at once a greater power of discrimination in the sense of touch and a smaller sensibility to pain. In Germany the director of the psychological laboratory at Kiel, Professor G. Martius, published researches on the perception of light and the duration of visual impressions; Professor Benno Erdmann, in Bonn, continued his investigations upon the recognition of letters and words. (See *PSYCHOLOGY OF READING*.) In Freiburg Dr. Jonas Cohn published *Gefühlston und Sättigung der Farben* (The Relation of Affective States of Consciousness to the Saturation of Color). In the psychophysical laboratory at Copenhagen, Denmark, Professor Alfred Lehmann has directed studies in the determination of the perception of differences of color, particularly purple; the perception of difference, similarity, and identity; and plethysmographic researches with the insane; and has himself experimented upon the determination of the mechanical equivalent of psychic energy, and published in German *Die Korporlichen Äusserungen psychischer Zustände*, Leipsic, 1899.

Psychological Literature.—Notable psychological works on special topics which have appeared in Europe in 1899 are: Z. Oppenheimer, *Physiologie des Gefühls* (The Physiology of Feeling), Heidelberg; Groos, *Die Spiele der Menschen* (The

Play of Man), Jena; Von Krafft-Ebing, *Psychiatrie und Neuropathologie*, Leipsic; O. Sommer, *Lehrbuch der psychopathologischen Untersuchungsmethoden* (Methods of Research in Psychopathology), Berlin; Fuchs, *Therapie der Anomalen Vita Sexualis bei Männern*, Stuttgart; Friedrich, *Hamlet und seine Gemüthskrankheit* (The Madness of Hamlet), Heidelberg; Von Bechterew, *Suggestion und ihre Sociale Bedeutung* (The Significance of Suggestion for Society), Leipsic; Hering, *Zur Theorie der Nerven-thätigkeit* (Theory of Nerve Action), Leipsic; Romer, *Psychiatrie und Seelsorger* (Psychiatry and Religion), Berlin; P. F. Thomas, *L'Éducation des Sentiments*, Paris; A. Binet (ed.), *L'Année Psychologique*, Paris; Gyl, *L'Être Subconscient*, Paris; Lalande, *La Dissolution*, Paris; Duprat, *L'Instabilité Mentale*, Paris. One of the most notable psychological publications of the year is the French Year Book of Psychology, mentioned above. The fifth volume (902 pages, Paris, 1899) contains seventeen original contributions, reviews, and digests of much of the periodical and other literature of the year and a classified bibliography of 2558 titles by Professor H. C. Warren, of Princeton University. Two works in Italian are especially worthy of mention—namely, Sancte de' Sanctis, *I Sogni* (Dreams), Turin; and Villa, *La Psicologia Contemporanea* (Contemporary Psychology), Turin. The work of de' Sanctis on dreams contains a treatment of the dreams of children, adults, old persons, neuropathics, of the mentally deranged, of delinquents, and of animals. It is found that women dream more frequently and more vividly than men, and remember their dreams better. Imbeciles and epileptics are infrequent dreamers, while paranoiacs and hysterics are constant dreamers. Of the delinquent class examined by de' Sanctis, less than 25 per cent. were dreamers. He finds also that the daily emotions of the normal human adults influence their dreams in about 60 per cent. of the cases. In English have appeared during 1899: G. F. Stout, *A Manual of Psychology*, London; Hugo Münsterberg, *Psychology and Life*, Boston; William James, *Talks to Teachers on Psychology*, New York; H. M. Stanley, *Psychology for Beginners*, Chicago; R. H. Hutton, *Aspects of Religious and Scientific Thought*; F. W. Bain, *Realization of the Possible*; A. W. Benn, *Philosophy of Greece*; Schofield, *The Unconscious Mind* (all London, 1899).

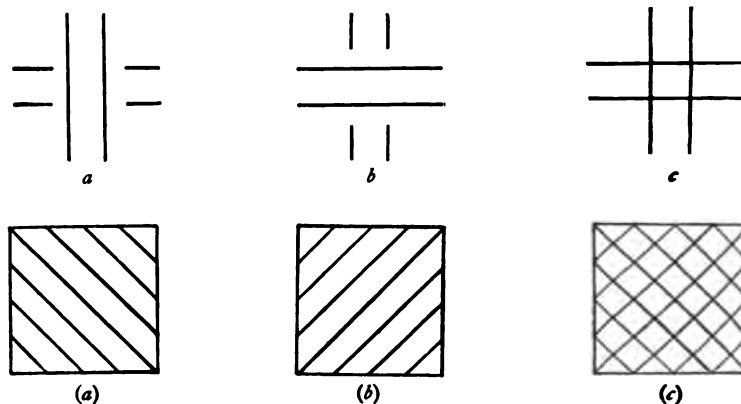
PSYCHOLOGY, EXPERIMENTAL. In the United States and Canada there were over twenty laboratories where research work was being done, the most important being those connected with the universities of Harvard, Yale, Princeton, Cornell, Columbia, Clark, Brown, and those of Pennsylvania, Chicago, California, Iowa, Wisconsin. Two methods in experimental psychology have led to different fields of investigation. The one method requires a laboratory and its many instruments, while the other is introspective, and requires only the writing materials necessary for recording the facts observed. Topics investigated in this manner are those of imagination and memory. An interesting and curious use of the introspective method was made by a German investigator in the subject of the sensations of being hypnotized. (See *Zeitschrift für Hypnotismus*, 1899.) Following is a brief account of some of the experimental work done in several of the more noted universities of the United States:

Brown University.—Professor E. B. Delabarre, of Brown University, reported in 1899 before the American Psychological Association results of certain ingenious experiments on visual perception as manifested in the judgment of the direction of lines. He discovered that one's judgment of the verticality of a line is influenced by a number of hitherto neglected factors, chief of which are the so-called attention fixation and the eye fixation. When the eye is directed to one small point in the field of vision it has generally been taken for granted that the eye remains motionless just as long as the attention remains fixed upon the same point. Professor Delabarre finds, however, that there is a slight motion of the eye, of which the observer is unaware. The eye and the attention are normally looking at different points, and even if the attention is held for some time upon one point, the eye shifts constantly, playing about the point of attention. "Normally the deviation between the two fixation points, that of the eye and that of attention, is large and constantly variable. Practice in steady fixation may diminish but not remove it, and may or may not make us conscious of its existence." This play of the eye about the point of attention is considered to be necessary, in order that the attention may be kept upon one point and yet allow some slight change in the whole retinal field, whereby the retina is less exhausted. Professor Delabarre demonstrated the actual motion of the eye by means of a microscope. He got his subject to look as steadily as possible at one point while a microscope was directed upon certain small blood vessels on the surface of his eyeball. An infinitesimal eye motion could thus be readily detected; and it was found that there is a continual motion of the eye, of which, however, the subject has no consciousness. This is certain to influence the judgment of the verticality of lines, because when the eye is fixed upon a point a short distance to the left of the centre of a vertical line and the attention upon the line, the ends of the line seem to be inclined slightly toward the point, while if the

point fixated by the eye is to the left of the lower end of the line, the whole upper part of the line seems to be slightly inclined toward the left. The same thing is true *vice versa*. Other factors in the judgment of the direction of lines are (2) the irradiation of the upper and lower ends of the line; (3) after-images (*q. v.*) of the line; (4) fatigue or degree of attention or distraction; (5) whether the right eye or the left or both be used; (6) expectant attention; (7) a tendency of the line to waver when looked at for any great length of time; (8) the presence of bright spots in the field of vision; and—a very important factor—(9) the ordinarily unconscious muscle strains of the head and the eye, which strains may be produced by several of the factors mentioned above. Thus, if a bright spot be introduced within the field of vision, it will attract the eye and arouse a strain of resistance. This strain will result in influencing the judgment of the vertical in the direction of the spot. The factors which influence the judgment of vertical lines will also affect that of any other lines, and other judgments of space as well as judgments of direction. The application of these researches is primarily in the explanation of certain geometrical illusions, and secondarily in the deduction of certain underlying and as yet ill-understood principles of art.

Columbia University.—From the laboratory of psychology of Columbia University were published in 1899 five researches of importance. These were: *The Emotion of Joy*, by George V. N. Dearborn, M.D.; *The Influence of the Weather on Conduct*, by Edwin G. Dexter; *Inhibition*, by B. B. Breese; *After-Images (q. v.)*, by Shepherd I. Franz; and *The Accuracy of Voluntary Movement*, by R. S. Woodworth. The laboratory was increased by the addition of nine rooms. The new rooms are to be used as research rooms in the field of vision. Unpublished original research carried on or completed during the year were those of Professor Cattell and Mr. Gerrard. Professor Cattell's researches were upon the relations of time and space in vision. He experimented with a visual stimulus, consisting of white, black, and colored surfaces moving rapidly behind a screen through a slit, in which they became visible for a short time. As the slit in the screen was very narrow and the colored surface about an inch square, the exposure was of so short a duration that the eye could not move. Thus, the effect of eye movement was eliminated. The stimulus was first one color and then another, thus making for the retina a time sequence of impressions, a sensation of red and after it a sensation of green in exactly the same place in the field of vision. As the eye cannot move, the same parts of the retina must be affected successively. When the same parts of the retina are affected by the two or more colors of a color-mixer the result is a uniform gray. The color-mixer is an apparatus consisting of a circular disc with green, red, etc., colored sectors, which is set in rapid motion, producing what is termed fusion or the melting of the two or more colors into another different color from either of the others. When a red stimulus follows a green in the instrument of Professor Cattell the result is not a uniform gray, but a patch of green color seems to be beside a patch of red, sometimes above or below, sometimes at one side or the other, and sometimes seeming to overlap one another. This fact is considered by Professor Cattell to illustrate a fundamental principle of visual perception, that from successive stimulations in time a perception of space results either intuitively or by gradual education. Professor Cattell takes an opposite view to that which the students of the psychology of reading propose, who say that when the eye moves from point to point on the line in reading a printed page it perceives nothing at all while actually in motion. He holds, on the contrary, that there are many perceptions made by the moving eye, pointing out that there is no fusion of retinal images observable in the ordinary perceptions of life where the eye moves, and that there is fusion where the object moves and the eye remains stationary. These two circumstances where fusion of images does and does not take place are, he considers, as the retinal conditions are quite analogous, a proof that fusion and clear perception are the work of the brain rather than of the eye, or, in psychological language, are of central rather than of retinal origin. Mr. Gerrard has carried out extensive researches in the emotional expression in literature. He caused a number of subjects to indicate while they read certain works of literature of various styles, such as *Hamlet*, *Rip Van Winkle*, *Heimat*, and others, at what points their emotional changes took place. He then analyzed these works into the different elements of dramatic moment, paragraph, sentence, clause, verb, noun, adverb, and adjective. Comparing the emotions experienced in reading these pieces of literature with the differing proportion of the elements above mentioned, he finds that the elements change with the emotion, and that their changes indicate almost exactly the emotion expressed; and has discovered a general rule respecting the use and value of each of the literary elements as found in all kinds of literature. He is thus enabled to assign a relative emotional value to each of the elements, and can so account for the weakness or strength of any literary work. During 1899 Mr. Gerrard also extended his research so as to include the emotional elements in music. In Dr. Dearborn's monograph on the emotion of

joy the results of experiments extending over several years are given. He finds that an emotion in proportion to its pleasantness is accompanied by an expansive tendency of the extensor muscles; he finds five components of the period of emotion—namely, psycho-physical excitement, various feelings, heightened consciousness of the relation between the object of the emotion and the subject agent, a pleasant or unpleasant tone of consciousness, and sometimes an increased self-reference. Dr. Franz's work on after-images has been noticed in a separate article under that title. Dr. Breese experimented upon inhibition in what is called retinal rivalry in the following manner: By means of a stereoscope he put before the right eye a figure (b), and before the left a figure (a). When both eyes are open the



phenomenon called retinal rivalry takes place. One sees not a figure like (c), but first (a) and then (b) and then (a) again, and so on indefinitely, the changes taking place at an interval of about five seconds. He found, however, that he and a number of other persons experimented on by him could increase the length of time that (a) or (b) was seen by fixing the attention on it, but the number of changes seemed to increase. It was observed that the eyes moved slightly in the direction of the lines of the figure which at that time occupied the attention; but the elimination of this eye movement decreased the ability to look steadily either at one or the other figure. If, on the other hand, an effort was made to follow with the eye the lines of either figure, it was possible to hold that figure longer. A like result was obtained by counting the lines. When other figures were used, those which induced the greatest eye movement remained longest in consciousness. If all the muscles on the right side of the body were voluntarily contracted, the figure on the right was seen longer. The after-images also were found to exhibit the same rivalry. Dr. Breese found that "when both figures were of the same color the rivalry between the two sets of lines was not affected, and that this retinal rivalry occurred not only between two eyes, but that different stimuli falling upon the same area of the retina of one eye produced the phenomena of rivalry. By these experiments it was shown that inhibition may be voluntary or that, of two sensations, we can inhibit the one by paying attention to the other. Other experiments were devised by Dr. Breese to ascertain the effect of different kinds of inhibition upon various states of consciousness. Thus, having observed that when persons endeavored to memorize a series of numbers or letters they tend to repeat them aloud, he caused his subjects first to hold their breath while trying to memorize, and second to repeat something incongruous with what they were trying to remember. In both of these cases he found that the memory consciousness was inhibited or overcome by the contradictory motor impulse. Dr. Breese considers these experiments strongly to corroborate the theory that consciousness is dependent equally upon its motor and upon its sensory factors—in other words, that every thought tends to express itself in an action, and the suppression of the physical action limits and restrains the mental activity. Professor Cattell is co-editor (with Professor J. Mark Baldwin, of Princeton) of the *Psychological Review*, and is the responsible editor of *Science*.

Cornell University.—The equipment of the psychological laboratory of Cornell has been largely increased, a special grant of funds having been made by the university. The collection of apparatus for experimentation in the senses of smell and taste is considered to be one of the best in the world. Several new and very extensive sets of apparatus for touch and hearing were, during 1899, added to the room

devoted to registration by the graphic method—a dynamometer, two ergographs, two pneumographs, an automatograph, a laryngograph, a sphygmograph, two plethysmographs, a tri-dimensional analyzer, a new pattern continuous paper kymograph, and several student kymographs. The borderland between conscious perception and the subconscious was the subject of one series of experiments at Cornell in the sense of hearing. When a sensation is so faint as hardly to be perceptible the effect is not a uniform but an intermittent perception, a perception which appears and disappears. Thus, as one looks at a very distant and almost invisible object, it is seen for a time, and then is lost. Mr. Cook, experimenting on hearing, found that when an almost imperceptible musical tone was produced, the hearer's attention directed to it could bring it into consciousness only periodically. It was heard only about every five seconds. Dr. I. M. Bentley published in 1899 the results of an elaborate series of experiments made by himself with the aid of a number of subjects as to the nature of the memory image. The memory image is the visual or other imagination which one has, with the additional qualification that it pertains to an actual experience, and is referred to the past. It is to be distinguished from the visual after-image, since this is supposed to be the gradual fading away of the effects of stimulation of the retina of the eye. The problem investigated had chiefly to do with the "qualitative fidelity" of the memory image—that is, not the individual capacity for retaining for a longer or a shorter time a given sight in his memory, but this ability to call up in his mind the quality of the sensation. The time, intensity, and quality chosen for experiment were three shades of gray so close as to be hardly distinguishable. By means of an apparatus devised for the purpose, he exposed to the subject's view a shade of gray made up of 60 per cent. white and 40 per cent. black, and produced by what is known in the psychological laboratory as a Marbe adjustable color mixer. This instrument consists of a disc which can be rotated rapidly, and so adjusted that the colors can be changed while in motion. When the disc is made up of sectors of all the colors of the spectrum, and the rate is rapid enough, the result is a uniform gray. If the rate is very slow a flickering of the different colors takes place. The same gray can be made by mixing a white sector and a black sector. The latter is the method used by Dr. Bentley. By dividing the circle of the disc into 100 equal portions, the proportions of the white and black sectors can be expressed in percentage. The proportion of white and black can be changed, thus making grays of different shades while the disc is rotating. The three shades of gray used in the experiment differed by a sector of only 5°, so that the shade first shown, called *A*, was lighter by 5° of arc than one of the others, *B*, and darker by 5° of arc than the other, *C*. After shade *A* was shown, there was a period of 5 seconds, and then either *B* or *C* was shown, and the subject judged whether the second appearance was lighter or darker. Sometimes it was judged to be the same. A curious and interesting law was observed in Dr. Bentley's 600 experiments. These experiments were carried on partly by diffused daylight of good intensity, where naturally the whole of the retina was acted upon, not only by the color mixer, but by the other objects in the room within the field of vision; and they were partly carried on in a dark-room, in which case the disc of the mixer was the only object which acted upon the retina. The result of this difference of conditions of the experiment was that in the daylight, the memory image by means of which the subject compared the first shade with the second, seemed to grow lighter and in the dark room the image grew darker, so that by daylight the second shade was thought to be darker, and in the dark, lighter than the first. Publications coming from the Cornell psychological laboratory in 1899 were the second edition of Professor Titchener's *Primer of Psychology*, and the fifth edition of his *Outlines of Psychology*. He published also *Zur Kritik der Wundtschen Gefühlslehre* (Review of Wundt's Theory of the Emotions) in the *Zeitschrift für Psychologie*, and *The Postulates of a Structural Psychology*, published in the *Philosophical Review*. Professor Titchener is the American editor of *Mind*.

Indiana University.—Two researches of great interest were reported during 1899 from this university by Professor William L. Bryan. Mental and physical tests were made into the conditions of the rapidity and accomplishments of the arithmetical prodigy, Arthur F. Griffith (*q. v.*), and a valuable research was published by Professor Bryan and Superintendent Noble Harter, of the public schools of Warsaw, Ind., on the subject of the acquirement of the telegraphic language. They recorded for periods of 40 and 28 weeks, respectively, the number of (1) letters not making words, (2) words not making sentences, and (3) words making sentences which their subjects, two students of telegraphy, could send or receive in one minute. To these records were added answers by expert telegraphers to the following questions: (1) To what is attention mainly directed at different stages of the progress? (2) How far can one "copy behind" in different stages of his progress? This question was framed in technical telegraphic terms to find out how much could be remembered at any given time, or how great was the span of consciousness

for the receiving of messages. (3) What happens when you have to receive the disconnected words of a strange code, or list of figures, such as bank clearings or the like? It should be here stated that in the American Morse system of telegraphing there are required, on an average, nearly 24 clicks for each word. This gives some slight insight into the difficulty of carrying many letters or words in the memory, particularly when it is remembered that in receiving a message the operator goes by the sound of the clicks of his instrument. It was found in response to question (1) that the operator can do no more when learning than to follow the letters successively, write them down, and look for the sense afterward. Later he can receive by paying attention to the words, and not listening so carefully to the letters. It should be borne in mind that in telegraphic messages only the shortest possible abbreviations for words are used, and that it would be impossible to spare the time necessary to spell every word completely. From the answers to question (2) it was learned that a good operator, in writing down a message, can be about six words behind the clicking of the instrument, and that an expert prefers to be as much as ten or twelve words behind. Question (3) elicited the fact that in the case of disconnected figures and code words, all operators endeavored to take them down as fast as they are given. The results of this detailed study of the telegraphic language, and the nature of the progress in learning it, are interpreted by Professor Bryan as showing that there is in every one a hierarchy of habits. In other words, one habit must be acquired in the learning of any subject before the next can be developed. This is shown equally well in children learning to read, and blind persons learning to read from raised letters. A striking difference is shown, too, between the progress of learning to send and of learning to receive a message. It is found that the ability to send a message progresses much more rapidly than the capacity for receiving, and sooner reaches the maximum, as that is soon limited by the physical conditions of moving the hand. The sender's ability also continues to improve at an approximately uniform rate. The capacity to receive, on the other hand, improves for about eight or ten weeks at a uniform rate, and then for about the same period of time there seems to be no improvement. This first progress and apparent halt is thought to be the time necessary to attain the habit of listening to the letter and word clicks. After that has become a sufficiently organized habit of the physical and mental system, the progress in learning to listen to whole clauses and sentences in telegraphic messages before writing them down becomes very rapid, and leads finally to mastery, and, in the case of a few operators, to the highest expertness. Professor Bryan points out that this interrupted progress is characteristic of nearly all mental acquirements, mentioning as instances the subjects of English composition, chemistry, music, mathematics, and the learning of chess and other games. The recognition of this is of evident value in education, as it will, in some respects, account for a very discouraging slowness and incapacity shown by nearly all students at certain points in their study of all branches of learning. The instructor should not regard this perfectly normal phenomenon as due either to any defect in method of instruction at that particular point or to laziness or a lack of interest on the part of the students, but rather to the fundamental nature of the formation of habit.

The University of Chicago.—The results of a number of experiments on the relations between certain organic processes and consciousness were published in 1899 (*Psychological Review*, Vol. VI., p. 32) by J. R. Angell director of the psychological laboratory. Plethysmographic records were taken in the shape of capillary pulse tracings, and the respiration was graphically recorded for short periods of time, during which either the subject was left to himself, and described the various thoughts and emotions occurring during the interval; or the subject was given some mental task to perform, such as an arithmetical operation. The results of these experiments show a general and uniform relation between the rate and depth of respiration, the pulse rate and the blood pressure, and the emotions and the sensations and the purely mental processes, including memory, reasoning, and undirected reverie. The results show that even in cases of similar psychical content the respiration and circulation vary greatly from time to time in accordance with the fluctuations of the attention; but that the general tendency of sensation is to make smaller the blood vessels in all parts of the body except the brain, and to send to the latter an increased amount of blood; and at the same time to accelerate the heart beat and the rate of respiration. The blood rushes to the brain, too, when some mental work is going on, whether memory or reasoning. Furthermore, emotions produce vaso-constrictions, or a lessening of the calibre of blood vessels, and a consequent afflux of blood to the brain. While the purely psychological processes mentioned call more blood than usual to the brain, it is not to be supposed that the reverse is necessarily true—namely, that when blood is sent to the brain in larger quantities (as may be done by doses of amyl nitrite), a corresponding mental activity results, as many investigations have proved the contrary. Thought affects the blood pressure, but blood pressure alone does not cause mental activity.

University of Iowa.—From the University of Iowa Professor C. E. Seashore publishes psychological statistics on the visual perceptions of interrupted linear distances, the material-weight illusion, the localization of sound in the median plane, hearing ability and discrimination, and sensibility for musical pitch; and on motor ability, reaction time, rhythm, and time sense. Dr. Seashore finds that there is a strong tendency to think that the source of any sound which comes from any point in the median plane is situated in front of the hearer and above his ears. In his experiments upon rhythm he finds that when a person is told to make a series of motions, the rhythm into which he naturally falls has the same time interval as the pulse, a multiple of the pulse rate, or sometimes that of the respiration. Dr. Seashore has made a valuable contribution to science in the shape of his new audiometer, an apparatus with which to produce sounds the intensity of which can be accurately measured. This has never been successfully accomplished before. It is found necessary in all experiments upon sensation to have an objective stimulus which can be accurately estimated physically before an attempt can be made to measure the discriminative power of the various senses. In the case of the sense of touch an impress is made upon the skin; either directly by a weight, or by a plunger attached to a spring, the pressure of which can be measured in ounces or grams. In the case of the senses of sight or hearing there has never been an altogether satisfactory means of measuring the real physical force of the so-called stimulus. Dr. Seashore has constructed an instrument which can vary with mathematical exactitude the intensity of the sound. It is made by sending to the receiver of a telephone the electrical energy generated by one, two, three, or more loops of the secondary coil of an induction coil. "The complete apparatus consists of an induction coil, a battery, a galvanometer, a resistance coil, switches, and a telephone receiver, all except the receiver being built into one compact and portable piece." The ordinary sound conveyed by the receiver to the ear of the subject is a click, but the switches are so arranged that the continuous tone of an electrically actuated tuning-fork may be reproduced with greater or less intensity in the telephone receiver. It has been pointed out that Seashore's audiometer will be of use not only in the psychological laboratory, but in aurists' offices, and in the school-room, where the hearing of pupils is to be tested.

University of Toronto.—From the psychological laboratory of this university were published two researches during 1899, one on the psychology of time, in which it is shown that Webers law holds good for the subjective estimation of time; and another on the time relations of poetical metres. In the latter research the experimenters, measured by means of a chronograph, the length in 100ths of a second the syllables in various poetical metres. They found the relation of the iambus and the trochee came very near being one of identity; but that the dactyl and anapest, besides being actually of longer duration than the other two metres, had each an order of syllable lengths peculiar to itself. It has been generally supposed that the anapestic rhythm might be regarded as a dactylic rhythm preceded by two unaccented syllables, and they have in all works on prosody been represented by a long and two equal short marks, thus dactyl — — —, anapest — — —. It is here shown that both metres are made up of a long, a shorter, and a shortest syllable, the dactylic having them in this order, but the anapestic having them in the reverse order. The relative lengths of the two short syllables being in the anapest in the order shortest, short, followed by the long, and in the dactyl the long followed by the short and then the shortest. This is of interest as affording a solution of the question whether there is an intrinsic difference between the dactyl and the anapest.

PSYCHOLOGY OF READING. Chiefly owing to its practical application in every-day life, the study of the mental and physical processes involved in reading is one of the most important branches of experimental psychology, and shows that the ability to read, which is expected of every one not illiterate, is physiologically and psychologically a complicated affair. This is true whether one reads silently or aloud. The thorough investigation of this subject will in the end prove of vast importance to philosophy in its elucidation of the processes of verbal thought. The latest and most important work on this subject is the 360-page volume, entitled *Psychologische Untersuchungen über das Lesen* (Researches in the Psychology of Reading), by Professor Benno Erdmann, of the University of Bonn, Germany, one of the foremost philosophical thinkers of the day, and his pupil, Professor Raymond Dodge, now of Wesleyan University, Middletown, Conn. The results of their investigation, partly corroborating and partly supplementing the previously discovered facts mentioned in the 1898 YEAR BOOK, may be summed up as follows: When reading, the eye moves from one point to another in the line, resting an instant on each point. During the short times while the eye is actually in motion, it is impossible to distinguish a single letter; consequently all the reading is done during the interval that the eye is looking at one point. This jerky motion of the eye fatigues the eye-muscles when carried on too long, and is a source of weakness

to the eyes. In words of medium length, the eye is generally looking at the middle letter and at the upper half of the word. In long words, the eye looks at the first half rather than at the second. In the case of easy, familiar prose, it was found that while reading a line about three and a quarter inches long, containing 47 letters, one observer moved his eyes on an average five times, and in reading a line four and three-quarter inches long, having 63 letters, another observer moved his eyes 7 times. The number of eye-jerks varies in lines of the same length, according to the length of the words and their position in the line, but this variation is so slight as to be almost negligible. It is thus seen that the eye in reading ordinary prose takes in about 9 letters at a time. An interesting comparison is made between the number of these eye-jerks in reading for the sense of the passage and reading for the spelling, as in proof-reading. In the latter, it is found that the average scope of the eye is only about 4 letters, instead of 9. A careful estimate of two factors in the eye movement in reading was made—namely, (1) the rate of movement from one stop to another, in going from left to right, and (2) the length of each stop. It was found that one observer's eyes, moving 5.6 times to each line, covered an angular distance each time of nearly 4° , and that the time occupied in movement was about .11 seconds, and in stopping about 2 seconds. The rate of movement naturally varies very slightly whether the text is familiar or unfamiliar, but if the text is unfamiliar the stops are of greater duration. It is noticeable, too, that the time occupied in stopping is more than ten times as long as that taken up in moving. The investigation of certain points connected with the perception of individual words must be noticed. In the first place, a table of figures given by Erdmann and Dodge shows that the time it takes to perceive a suddenly displayed illuminated surface and make a signal to that effect is .222 second. This is what is known as a simple reaction. It takes .434 second, or nearly twice as long, to call the name of a letter instantaneously shown. It would seem that to name a word of 4 letters would take 4 times as long again, but this is not the case. To perceive a 4-letter word was found by these experimenters to take .430 second. Moreover, an 8-letter word was perceived and named in .449 second, a 12-letter word in .543 second, and a word of 16 letters in .509 second. So that if it takes four-tenths of a second to name a single letter, it takes only a little over five-tenths to call the name of a word containing 16 letters. An extremely ingenious manner of finding what point in any word is actually looked at, technically called the "point of fixation," must be mentioned. It is a familiar fact that the eye retains a strong impression for some time after the cause of the impression has been removed. Fix the eyes upon a red circle for a minute, and then look at a small point in the centre of a white surface, and a green circle will be seen, which subsequently changes color a number of times and finally disappears. A red cross will produce a green cross in the same way. This second image is called the *after-image* (*q. v.*). A peculiarity of the after-image is that it moves with the eyes, possibly because a certain part of the retina was temporarily overworked, and so always remains in the same relative position in the field of vision. Messrs. Erdmann and Dodge made a very curious and clever use of the after-image in their experiments, in order to find in what parts of the line the point of fixation fell in reading. So before reading a line they looked steadily for a short time at a red spot the size of a capital letter, and then read on in the ordinary way. The small green after-image was observed to rest now on one and now on another letter of the text. These letters were marked with a pencil, or identified in some other way, and thus were shown to be the points of fixation in question, or the parts of the words directly looked at. It was found that this point generally fell in the middle of a word, and never between two words, but sometimes between two letters of the same word. It was furthermore ascertained that the word is taken in as a whole and not by spelling it out letter by letter. It was found that words could be correctly read, in a large percentage of cases, when they were so far from the eye that the individual letters were just indistinguishable, showing that, in some way, the mind helps the eye to see what is, as it were, physically invisible. It was found also that as long as the eye was kept directed to one letter, only about a half a dozen letters to the left of it and about the same number to the right could be distinguished. This is a valuable indication of the extreme narrowness of human vision while the eye is at rest, and helps the uninitiated to realize that his sight takes in, fully, only about 4° of the 360° of the circle, or of the 120° , more or less, which is the ordinary compass of one eye for the detection of moving objects.

PSYCHO-THERAPEUTICS. See SUGGESTION.

PUBLIC HEALTH. See ALCOHOL.

PUBLIC HEALTH ASSOCIATION, AMERICAN, held its annual meeting at Minneapolis, Minn., beginning October 31, 1899. Professor Welch, of Baltimore, acted as honorary chairman.

PORTO RICO.

Scale of Miles.
0 5 10 20

Legend:
 — Railroads:
 — Common Roads:
 — Steamship Lines:
 - - - Submarine Telegraph Lines:
 ● Capital of Island:
 ○ Capitals of Divisions:
 ✕ Lighthouses:

C O C E A N
C A R I B B I A N S E A

67° 68° 69° Longitude West from Greenwich
18° 19° 20° Latitude North

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PUERTO RICO, or more commonly spelled Porto Rico, a West Indian island, acquired in 1898 by the United States as a result of the war with Spain, has an area of 3668 square miles, with a coast line of 360 miles and a population of about 850,000. At the close of the year 1899 the preliminary estimate of the population was 957,679. The mountains form the greater portion, about nine-tenths, of the area, the lowlands being around the coast of the island. The greatest altitude is 3790 feet, which is reached by the western summit of El Yunque in the Sierra Luquillo, the eastern summit being almost the same height. According to a report of the United States Insular Commission, dated June 9, 1899, the people are "most loyal in their devotion to their new country, and are solicitous to be regarded as a part of the United States." There are numerous well-to-do and intelligent people, but there is a great deal of poverty among the lower classes, yet before the great and disastrous hurricane of August 8, 1899, there was no actual starvation. The religion was that of the Roman Catholic Church, the only church edifice of any other denomination being the Protestant Episcopal Church at Ponce. The priests, formerly paid by the Spanish government, are now obliged to get their subsistence from the contributions of their congregations. Education was in a very backward state, due to the neglect of the Spanish authorities. In 1898 there were 554 schools in Puerto Rico, 510 public and 44 private, with an enrolment of 27,936. At the same time there were 125,695 children of school age, leaving 97,759 children without school privileges. Eighty-seven per cent. of the white population and eighty-six per cent. of the colored population are said to be illiterate. In January, 1899, General John Eaton, who was, from 1870 to 1886, United States commissioner of education, undertook the task of reorganizing the educational system of the island. The government in 1899 was entirely in the hands of the military governor, but important steps had already been taken both toward a free education for the people and toward a new form of government better adapted to their nature. The currency is made up of Puerto Rican silver and the paper currency of the Spanish bank of San Juan. The Puerto Rican dollar or peso was valued on January 20, 1899, at \$0.60. The municipal governments were in 1899 managed on the same bases as under Spanish régime. The climate is equable, there being but a slight annual variation in temperature. The annual rainfall varies from 120 inches in the northeast corner of the island to about 40 in the southwest. The communication and transportation on the island is by means of the railway extending from Carolina, about 14 miles east of San Juan, to the capital, and thence west along the coast to Camny, the total mileage being 137. There are 170 miles of railway under construction. The agricultural products of the island include vegetables of all kinds and Indian corn, besides the more important coffee, sugar, and tobacco.

The Great Hurricane of 1899.—All that might be said of the fertility of Puerto Rico and its prosperous outlook in the early months of the year would have to be contradicted after the terrible hurricane which visited the island on August 8, 1899, wrecking many of the coffee and sugar plantations, and rendering thousands homeless and destitute. The official report of Brigadier-General George W. Davis, dated December 15, 1899, says:

"As respects the number of persons who on August 8 lost all, or about all, but their lives, the original estimate was close to the truth—that is to say, the numbers of the class referred to aggregate about a quarter of a million. Nor was the extent overstated to which they were victims. In one particular, however, it was understated. These poor peones were left without the material (palm leaves) with which to rebuild their huts, for the tornado decapitated every palm tree in its path. Fortunately, the climate is mild, and the suffering from a lack of shelter was light. It was only the sick who really suffered, for they had no protection from the summer rains. Medical service was deficient and medicines unobtainable at first. There are no hospitals and could be none save those that the board of charities improvised. The destruction to roads was rather more than I reported, above \$100,000 of insular revenues having been already spent in repairs, and as much more will be required to reconstruct and rebuild. Some important bridges must wait until next year. Tobacco suffered very little, but the loss of the Cuban market had already disarranged planting, and as the crop had been harvested, there was no growing crop to injure; but the tobacco laborers suffered to the same extent in loss of huts, provision crops, etc., as all other peones. Sugar-cane was greatly injured by overflows and sedimentation, but was benefited—that is, fertilized—by the same for future crops. There was extensive injury to sugar mills, some of which, being old and obsolete, will never be rebuilt."

The following is an estimate made by General Davis as to the probable yield of coffee, sugar, and tobacco for 1899-1900:

Staple.	Estimated Value for Export, 1899-1900.	Actual Average Export, 1893-97.	Reduction.
Coffee.....	\$600,000	\$6,080,409	\$5,480,409
Sugar and molasses.....	2,100,000	2,403,963	303,963
Tobacco.....	450,485	450,485	.....
Total.....	\$3,150,485	\$8,934,857	\$5,784,372

The Insular Commission.—The report of the insular commission, sent by the President to Puerto Rico to investigate the civil affairs of the island, was submitted May 27, 1899. The commission was composed of General Robert P. Kennedy, Judge H. G. Curtis, and Major C. W. Watkins. They submitted with the report a number of recommendations for improvements in the various administrations of the island, of which the following is a summary: 1. That all Spanish laws and royal decrees be abolished in favor of the common law of the United States. 2. That a new system of taxation be introduced. 3. That a school system with a majority of American teachers be inaugurated. 4. That a number of judicial courts be instituted on the American plan, the official language to be English in the federal and supreme courts and Spanish in the inferior courts. 5. That church and state be completely separated. 6. That in order to prevent the concubinage so prevalent on the island, where formerly fees of priests made marriage impossible for poor persons, so-called common-law marriages be recognized, all marriages be recorded, and, further, that divorces be decreed for good cause, as allowable in the United States. 7. That the president make "such modifications in the tariff schedules between the United States and Puerto Rico as he may deem wise, pending the action of Congress in fixing the full status of the island province." 8. That a new and complete census be made. The United States Geological Survey has issued a report on the mineral resources of Puerto Rico by Hill. See COLONIES and UNITED STATES.

PUTNAM, HERBERT, librarian of Congress, was appointed to that position on March 13, 1899, to succeed John Russell Young, who died on the 17th of the preceding January. Mr. Putnam is the son of the late George P. Putnam, publisher, and was born in New York City, September 20, 1861. After his graduation at Harvard in 1883 he took a partial course at the Columbia Law School, and two years later was admitted to the bar in Minneapolis, Minn. He soon became librarian of the Minneapolis Athenæum, and later was instrumental in founding the Minneapolis Public Library, which is known as one of the most progressive libraries in the country. In December, 1891, he resigned as librarian in Minneapolis, and removed to Boston to practise law, where he was engaged in legal work until 1895, when he became librarian of the Boston Public Library. This is one of the largest and most efficient libraries in the United States. In 1898 Mr. Putnam was president of the American Library Association. The best authorities regard him as a most capable librarian. He has published various articles in professional journals and other magazines.

PYRITE. The chief use of pyrite continued to be for the manufacture of sulphuric acid and sulphur. The yield for the last two years was: 1898, 193,364 long tons, valued at \$593,801; 1897, 143,201 long tons, valued at \$391,541. About 70 per cent. of the production came from Virginia, 22 per cent. from Massachusetts; the balance from California, Colorado, New York, North Carolina, Ohio, and Tennessee. The imports of pyrite containing less than 3.5 per cent. of copper amounted to 252,773 long tons, valued at \$717,813. That with over 3.5 per cent. copper is treated as copper ore. This production was 761,754 long tons.

QUARTON, BERNARD, a well-known London art dealer and book-seller, died December 17, 1899. He had a wide reputation among bibliophiles, and was undoubtedly one of the greatest dealers in rare and old books, the modern market for which was largely made by him. He was born in Germany in 1818, and went to London for permanent residence in 1845.

QUARLES, JOSEPH VERY, United States senator from Wisconsin, was elected, as a Republican, by the legislature, to succeed Senator John L. Mitchell, Democrat, January 31, 1899. Born December 16, 1843, at Kenosha, Wis., he was graduated at the high school there, and in 1862 entered the University of Michigan, but soon left to join the Thirty-ninth Wisconsin Volunteers, becoming first lieutenant of Company C. After being mustered out he re-entered the university at Ann Arbor, being graduated in 1866, and two years later was admitted to the bar. Subsequently



1

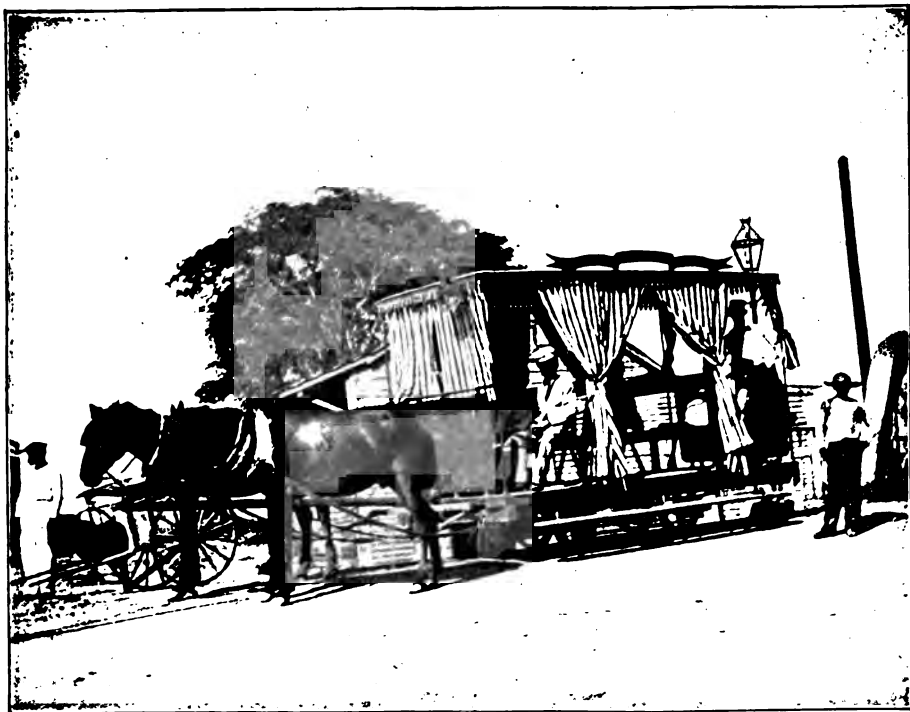


2

SCENES IN PORTO RICO,—1. Beggars at San Juan. 2. A street in San Juan.



3



4

3. The Market, Ponce. 4. The only tramway in Porto Rico, at Mayaguez.

he served in both houses of the Wisconsin legislature, and then, having settled in Racine, practised law there until 1888, when he removed to Milwaukee. His term in the Senate will expire March 3, 1905.

QUAY, MATTHEW STANLEY, United States senator from Pennsylvania, was born in Dillsburg, Penn., September 30, 1833. He graduated at Jefferson College in 1850, and in 1854 was admitted to the bar. He was lieutenant in the Tenth Pennsylvania Reserves, and colonel of the One Hundred and Thirty-fourth Pennsylvania Volunteers during 1861-65; was a member of the legislature in 1865-67; secretary of State for Pennsylvania in 1872-78 and 1879-82, and recorder of Philadelphia in 1878-79. In 1885 he became State treasurer, and since that year has been a member of the Republican national committee, of which he was chairman in 1888. In 1896 he was a member of the executive committee. From 1887 till 1899 he was United States senator. In the latter year Mr. Quay was indicted for conspiring to use for his personal profit State funds deposited in the People's Bank of Philadelphia. He was brought to trial on April 10, 1899, at Philadelphia, and on April 21 the jury rendered a verdict of not guilty. Governor Stone immediately appointed him to the vacant United States senatorship, which the legislature had been unable to fill. Charges of unconstitutionality were raised, and the Senate referred the matter to a committee, but no decision had been reached at the close of the year.

QUEBEC, a province of the Dominion of Canada, with an area, as increased by act of Parliament, of 347,350 square miles, exclusive of the Gulf of St. Lawrence and the territorial seas. Capital, Quebec.

Mineralogy.—Iron ore shows a fluctuating production, but no marked increase. The output in the calendar year 1897 was 22,436 tons, somewhat less than that of 1892, and only 3191 tons in excess of the average of intervening years. Gold-mining made a notable rally, with an output valued at \$6089 in 1898, against \$900 in 1897, and \$3000 in 1896. High water-mark was reached in 1881, \$56,661, and the largest production since was in 1894, \$29,196. In copper there was a production that gave for export 541,401 pounds. Salt yielded 1100 bushels in 1897, with no report for 1898; and silver, 80,475 ounces, valued at \$48,116 in 1897, with no report for 1898. The output of phosphates shows a steady decline, with 3469 tons in 1895, 528 in 1896, 21 in 1897, and 165 in 1898, the highest recorded production being in 1890, 26,521 tons. Mining laws of the province are liberal, but the industry lacks official encouragement, modern appliances, and capital.

Fisheries.—The value of all fishery catch in the calendar year 1897 (the last officially reported) was \$1,737,011, a decrease in a year of \$288,753, and the lowest value since 1890. The principal catch was cod, \$667,202; lobsters, \$207,710, and herring, \$196,530. Exports of all fisheries in 1898 amounted to \$485,135; the distribution of fry was 6,435,000, and the capital investment in all fisheries, \$583,403.

Commerce.—In the fiscal year ending June 30, 1898, the imports of merchandise aggregated in value \$62,550,471, the largest of all the provinces, and the highest recorded in Quebec; exports, domestic and foreign, \$73,327,220, an increase in a year of \$13,052,084; duty collected, \$8,386,122. Navigation was facilitated by 118 light-stations, 159 light-houses, 8 light-ships, and 4 fog-alarms. The registered merchant marine of the province comprised 322 steamers, of 75,349 gross tonnage, and 1056 sailing vessels, of 69,198 tons.

Banks.—On January 1, 1899, there were 117 chartered banks and bank branches in the province, and during 1898 the exchanges at the clearing house in Montreal amounted to \$731,264,677, an increase in a year of \$130,079,677. There were also 140 post-office savings banks, with 19,578 depositors and \$5,450,746 deposits.

Railways and Telegraph.—On June 30, 1898, the total length of railways in operation was 3315 miles, the second largest provincial mileage in the Dominion, and the total grants to roads constructed and under construction then amounted to \$21,053,992. Government telegraphs had a total of 808½ miles of land lines, and 44 miles of cables, with 54 offices.

Post-offices.—At the end of 1898 there were 1698 post-offices in the province, in which were posted during the year 31,125,000 letters and 4,950,000 postal-cards, and 371 money-order offices, which issued 136,090 orders.

Education.—Reports for the school year 1897-98 showed municipal schools, 5544; independent, 354; elementary, 5167; superior, 731; schools of arts and manufactures, 7, and agricultural and dairy schools, 4—total, 5898. Of all schools, 4998 were Roman Catholic and 979 Protestant; Roman Catholic enrolment in Roman Catholic schools, 273,755; in Protestant schools, 2705; Protestant enrolment in Roman Catholic schools, 1404; in Protestant schools, 35,930. Pupils and students in all schools aggregated 314,731; teachers, 10,493. Total expenditures were \$1,730,396, of which the government appropriated \$304,410. Roman Catholic schools included 2 universities, 19 classical colleges, 127 academies, and 3 schools for deaf-mutes and the blind; and Protestant schools, 2 universities, 3 university colleges, 26 academies, and a

charitable school. Of both classes there were 534 model schools. At the end of 1899 there were 119 periodicals, of which 16 were dailies and 71 weeklies.

Finance.—The revenue of the province in the year ending June 30, 1898, was \$4,176,140; expenditure, \$4,415,370; gross debt, \$35,450,548; Dominion government debt allowance, \$2,549,214; Dominion government railway subsidies, \$2,394,000; other assets, excluding public buildings, \$8,902,855—total assets, \$13,846,069; net debt, \$21,604,479.

Population.—Local estimates in 1898-99 gave Montreal 250,000; Hull, 12,371; Sherbrooke, 10,470; St. Hyacinthe, 10,044; Ste. Cunegoude, 9943; Valleyfield, 8010; Westmount, 6953; St. Johns, 5000. The Indian population of the province in 1898 was 10,677. There were 17 schools for Indian youth, which had an enrolment of 748, and average attendance, 342. The Indians cultivated over 9000 acres of land, had 2438 head of live stock, and received \$105,541 from their various industries.

QUEENSLAND is a British Colony in northeastern Australia. It has an area of 668,252 square miles, with a seaboard of 2250 miles, and it had an estimated population in 1899 of 499,000. The capital is Brisbane, which, including an area with a radius of 5 miles, had an estimated population in 1899 of 107,840. This city is situated on the Brisbane River, 9 miles from the mouth and about 40 miles from the entrance to Moreton Bay, into which the river empties. The river has a depth of 20 feet, which is soon to be increased by government engineers. Other important ports of Queensland are: Rockhampton, population, 19,650; Townsville, 16,500; and Maryborough, 14,000.

Production and Commerce.—About 97 per cent. of the colony consists of land still possessed by the crown, and about one-half the total area is natural forest. Government lands are being gradually disposed of by direct sale on the instalment plan and by leases, with or without the right of purchase. Stock raising and agriculture are the principal occupations, and there is also considerable mining done. Maize is the principal grain crop, and wheat, oats, and barley flourish in certain parts. The amount of wheat and sugar produced is rapidly increasing. The live stock at the beginning of 1899 included 17,552,608 sheep, 5,571,292 cattle, and numbers of horses and swine. In 1897 the number of cattle and sheep decreased greatly, the latter by nearly 2,000,000, and this decrease, though in lessening degree, continued up to 1899. The decrease was due to the prolonged droughts which have prevailed throughout Australia. (See NEW SOUTH WALES.) Among minerals are gold, coal, tin, silver, copper, opal, and lead, named in the order of importance. Owing to the small number of large streams, water is obtained through Artesian wells, of which there were in 1898, 344, averaging nearly 1300 feet in depth. The greatest depth is 4010 feet, at Winton. There were 44 bores in progress in 1898, averaging over 1900 feet in depth. The commerce of Queensland for 1898 amounted to £10,856,127 for exports and £6,007,127 for imports. Most of the trade is with Great Britain and her colonies. As to imports from foreign countries, exclusive of Great Britain, the United States sends over half. Her principal article of purchase in Queensland is wool. The value of wool exported to all countries in 1898 was £3,009,462; gold, £2,830,553; sugar, £1,329,876; meat, £941,308; live stock, £808,818; other exports being timber, animal products, pearl, tortoise shell and other sea products, silver, and tin. Large quantities of imports and exports pass through Victoria, the chief imports being various manufactures, spirits, chemicals, oils, grains, and flour. Queensland is being brought into closer communication with the United States by a line of steamships between New York and Brisbane. There is a line of mail steamships between Queensland ports and Great Britain. In 1898 the registered shipping of Queensland amounted to 95 steam vessels, with a tonnage of 13,810, and 143 sailing vessels, with a tonnage of 9994. The former are engaged mostly in the coasting trade and the latter in trade with the Pacific islands. The entire tonnage of vessels entering and clearing in 1898 was 602,006 (615 vessels) and 596,313 (598 vessels), respectively.

Government, etc.—The executive authority is vested in a governor (Lord Lamington since 1895), who is commander-in-chief of the troops, and vice-admiral; the legislative authority is a bicameral parliament, consisting of a legislative council, whose members are appointed by the crown for life, and a legislative assembly, whose members are elected by popular vote. The colonial expenditure in 1898 was £3,802,795, and the revenue was £3,891,767. The public debt in 1898 was £33,598,414. In the same year there were 2742 miles of railway open, owned by the colonial government. Lines start from each of the principal ports—namely, Brisbane, Maryborough, Bundaberg, Rockhampton, and Townsville—and run into the interior. Further communication is by means of bullock drays and upon the rivers, none of which, however, is navigable for more than 50 miles from its mouth. In 1898 there were 18,565 miles of telegraph lines. As to education, there were 843 state schools, with 1904 teachers and an average attendance of 58,296 children: 181 private schools had an attendance of 11,044.

History, 1899.—The elections held in 1899 gave such support to the government as to make it possible for the assembly to pass in June the bill consenting to the federation scheme for the Australian colonies. This matter is fully discussed in the article Australian Federation (*q. v.*). In common with the other Australian colonies, Queensland made an offer of troops to the imperial government for service in the South African war, and in October the offer was definitely accepted, and a force of 250 mounted infantry was despatched to the seat of war. There was some opposition made to this offer on the part of the Labor party in Queensland. The cabinet resigned in November, owing to its inability to carry out certain policies, that relating to the construction of new railways being passed by a bare majority. As in each of the other colonies supporting the federation movement, the government lost the support of many who had stood by it until the Enabling bill was passed, and who then returned to their former parties. On November 28 Mr. Dawson undertook to form a new cabinet.

QUESNAY DE BEAUREPAIRE, JULES, French magistrate and author, who was concerned in the Dreyfus case, was born in Saumur, France, July 2, 1838. He entered law, and on the fall of the empire volunteered his services, and took part in the defence of Paris. In 1877 he was defeated for parliament by the Duc de la Rochefoucauld, upon which he again engaged in the practice of law. In 1881 he was made attorney-general at Rennes, and in 1883 became advocate-general in Paris. As attorney-general in 1889 he became conspicuous in prosecuting General Boulanger and M. Rochefort before the senate, when they were condemned to imprisonment for life. The papers supporting the Boulangist cause attacked him so unwarrantably that he brought suits for damages. In 1892 he was made president of the Court of Cassation, but resigned in January, 1899, because of the partiality the judges evidenced in the Dreyfus investigation. M. Quesnay de Beaurepaire has written novels under the pen name of Jules de Glouvet, among which are *Le Forestier*, 1880; *Le Berger*, 1882; *L'Idéal*, 1883; *La Famille Bourgeoise*, 1883; *Le Père*, 1886; and *Marie Fougère*, 1889. His *Histoire du Vieux Temps*, extracts from his uncle's papers, 1865, passed into its third edition in 1890. M. Quesnay de Beaurepaire is a commander of the Legion of Honor.

QUICKSILVER. California continues to supply all of the domestic ore. The production from this State amounted in 1898 to 31,092 flasks. The celebrated New Almaden mines continue to be an important source of supply, and it is interesting to note that the ore, which is now being worked at a profit, contains but 1 per cent. of metallic mercury.

QUINCY, JOSIAH, Democratic mayor of Boston from 1895 to 1899, was born in that city in 1859. He is the grandson of Josiah Quincy, who was mayor of Boston in 1845. After receiving an academic education, he studied law and was admitted to the bar, but he never practised. He served in the Massachusetts legislature, was chairman of the Democratic State convention, was assistant secretary of State in 1893, and was elected mayor of Boston in 1895, and re-elected in 1897. He has established and promoted many reforms and benefited the city to such a degree that he is considered one of the foremost men in municipal affairs in the country. He was not renominated in 1899, and was succeeded as mayor by Mr. Thomas N. Hart (Rep.).

RABIES. The following table gives the results of the antirabic treatment at the Institute Pasteur, Paris.

Year.	Cases.	Deaths.	Per Cent.	Year.	Cases.	Deaths.	Per Cent.
1886-87.....	2,671	25	.94	1893-94.....	1,648	6	.36
1887-88.....	1,770	14	.79	1894-95.....	1,387	7	.50
1888-89.....	1,692	9	.55	1895-96.....	1,530	5	.33
1889-90.....	1,830	7	.38	1896-97.....	1,306	4	.30
1890-91.....	1,540	5	.32	1897-98.....	1,521	6	.39
1891-92.....	1,556	4	.25	1898-99.....	1,465	3	.20
1892-93.....	1,790	4	.22				

RACHMANINOFF, SERGEI VASSELIEVITSCH, Russian composer, born in 1873 at Novgorod, studied at the Moscow Conservatory under Arensky and Siloti, and obtained the first gold medal at the age of seventeen. His works include a piano concerto, a fantasia for the piano, a trio in D minor for piano, violin, and 'cello, with harmonium obligato, and a prelude for the piano in C-sharp minor. He appeared

in London at the Philharmonic, April 19, 1899. Although so young, he is regarded as one of the most important of the living Russian composers.

RACQUETS, or RACKETS, a game resembling court-tennis, but simpler, played in a paved court, surrounded by four walls. Racquets has become popular in this country among a growing number of players. One of the first and most notable organizations which have taken it up is the New York Racquet and Tennis Club. In 1899 the Racquet and Tennis Club at Tuxedo, N. Y., was formed, and a club-house built, which is said to contain courts rivalling the best of those abroad. One of the officers and the coach of the game at Tuxedo is Eustace H. Miles, of Cambridge University, the noted amateur British racquet and court-tennis player. The United States amateur racquet championship tournament for singles was held at New York in February, 1899, and was won by Quincy A. Shaw, Jr., of Boston, who defeated H. H. Hunnewell, of Boston, in the finals. Shaw and Hunnewell played together in the championship doubles, held at Philadelphia during the same month, and beat M. S. Paton and Clarence H. Mackay, of New York, in the finals. Early in the year Mackay defeated the Canadian racquet champion Rolland. Later Shaw played Rolland for the Canadian championship of 1899, and lost.

RAILWAY ASSOCIATION, AMERICAN, organized in 1886, in 1899 had a membership of 257 railway companies, operating 171,718 miles of line; it holds two meetings annually. Secretary, W. F. Allen, 24 Park Place, New York City.

RAILWAYS. In railway construction, maintenance, and operation the year 1899 was a remarkable one in many important respects. This assertion is true of all departments of railway operation and of all sections of the country, and it lends unusual interest to a review of the year's railway business. For the purpose of this review the subject will be considered under the following headings: (1) Accidents; (2) cars; (3) construction; (4) fast runs; (5) foreign railways; (6) grade crossings; (7) locomotives; (8) road-bed and track; (9) shops; (10) signaling; (11) traffic; (12) train weights.

Accidents.—According to the figures of the interstate commerce commission for the year ending June 30, 1898, which are the latest accident statistics available for the whole United States, the aggregate number of persons killed in railway accidents was 6859, and the number injured was 40,882. The number of passengers killed was 221, and the number injured was 2945, all other fatalities being among the employees of the railways. The figures of 1899 will show no material diminution or increase from those given above.

Cars.—Returns from all the contracting car builders in the United States for 1899 show that during the year 123,893 cars of all kinds were built. These figures do not include cars built by the railways themselves or small cars for plantation work and similar special duty. Of this total, 117,982 were freight cars, 1201 were passenger cars, and 4710 were street cars; 1904 freight cars, 104 passenger, and 206 street cars were for export. Of the freight cars, 10,500 were steel cars. Combinations of car-building concerns have been a notable feature of the year; 13 companies have consolidated under the name of the Southern Car and Foundry Company, the Wagner Palace Car Company was absorbed by the Pullman Palace Car Company, and the two largest concerns manufacturing steel cars have combined under the name of the Pressed Steel Car Company. Perhaps the most striking feature of the year's car construction was the vastly increased output of steel cars. In 1898 the number of steel cars built was 2700, or about one-fourth the number built in 1899. These cars were mostly 50-ton and 40-ton coal and ore cars of the hopper bottom and gondola types. In addition to the increase in the number of cars built entirely of steel, there has been a notable increase in the construction of cars with steel under-frames and timber upper parts. There was also a substantial increase in the use of steel bolsters and truck parts where formerly wood was employed. Steel castings have to some extent replaced cast iron in trucks and other parts. The principal advantages argued in favor of steel cars of 40 and 50 tons capacity are their great capacity in proportion to their weight and their superior strength and durability over wooden cars. These qualities suggest that the chief field of usefulness for such cars will be in coal and ore service, and it is mostly for this class of traffic that they have been built in the past. For general service, cars with steel under-frames and wooden upper parts possess in many respects superior advantages to all steel construction.

The equipment of freight cars in the United States with automatic couplers and train brakes made substantial progress during 1899. The time now set by the Interstate Commerce Commission when all cars shall be equipped with these safety appliances according to the federal law is June 30, 1900. Considerable trouble has been had within a year or two from the breakage and improper operation of automatic couplers, owing to poor material and faulty construction and design, and at

its convention in June, 1899, the Master Car Builders' Association adopted rules and specifications for the manufacture, application, and operation of such couplers, with the view of remedying this trouble. The question of adopting automatic couplers of the American pattern on English railways came up for consideration during the year. It does not seem likely, however, that such couplers will find much favor abroad as long as the standards of car construction there remain as they are at present.

Construction.—The total mileage of railways in the United States on January 1, 1899, was 184,894 miles. During the 12 months of 1899 there were built 4500 miles of new line, which brings this total up to 189,394 miles. The bulk of the new construction was in the States west of the Mississippi River; over 75 per cent. of it was built by existing railways. Iowa heads the list of States in the amount of new railways built with 582 miles. Following Iowa come Minnesota, with 369 miles, and Arkansas, with 269 miles. The States of New Hampshire, Rhode Island, Delaware, Nevada, and South Dakota added no new line to their existing mileage during the year. According to the best available figures, about 500 miles of new railway were built in Canada during the year, and about 300 miles were built in Mexico. The 4500 miles of railway built in the United States in 1899 is the largest year's construction since 1890, when 5670 miles were built.

In connection with new construction it is important to notice that it was somewhat handicapped by the high price of iron and steel and the inability in some cases of the mills to supply orders. (See IRON AND STEEL.) As an illustration of these facts the accompanying table is of particular interest. These figures are based upon actual ruling prices of material and labor during the two years.

Table Showing Approximate Cost of Railroad Track Per Mile in December, 1898, and December, 1899, Exclusive of Grading, Culverts, Bridges, etc.

	WEIGHT OF RAIL.					
	56 Pounds.		70 Pounds.		90 Pounds.	
	1898.	1899.	1898.	1899.	1898.	1899.
Rails.....	\$1,760.00	\$3,080.00	\$2,200.00	\$3,850.00	\$3,828.00	\$4,950.00
Spikes, 5½ ins. × 9-16 in.....	90.00	180.00	99.00	198.00	99.00	198.00
Angle plates.....	118.27	271.04	188.96	387.20	190.08	435.60
Bolts, nuts, washers and braces.....	55.50	98.00	77.40	141.00	82.40	146.00
Ties.....	1,820.00	1,980.00	1,500.00	2,250.00	1,500.00	2,250.00
Track laying, including construction train.....	500.00	575.00	600.00	690.00	600.00	690.00
Ballast.....	300.00	360.00	900.00	1,050.00	1,500.00	1,800.00
Total.....	\$4,143.77	\$6,544.04	\$5,545.36	\$8,566.20	\$6,799.48	\$10,469.60

Fast Runs.—Numerous fast runs for short distances have been made by regular and special railway trains during the year, the speed of over 100 miles per hour having been developed over portions of some of these runs. Among the fast long runs recorded the following are fairly representative: Chicago, Burlington and Quincy Railroad, fast mail, 502 miles in 10 hours 29 minutes, 46½ miles per hour; fast mail, New York to San Francisco, in 97 hours 55 minutes, or an average speed of 37.2 miles per hour; Terre Haute and Indianapolis Railroad 235¾ miles in 263 minutes; or an average speed of 53.76 miles per hour; Lake Shore and Michigan Southern Railway, 183 miles at an average speed of 57.8 miles per hour.

Foreign Railways.—A notable number of important foreign railway enterprises developed during 1899. Russia's railway budget for 1899 proposed the expenditure of \$51,000,000, a large part of which was devoted to new construction. Not including 1590 miles of railway in Finland, there were 26,797 miles of railway in operation in Russia in 1898, with 7000 miles of new line projected and under construction on January 1, 1899. The most important of the Russian railways is the Trans-Siberian Railway, which, when completed, will be the longest continuous railway line ever built. The longest continuous line on the North American continent is the Canadian Pacific Railway. Its main line from Montreal to Victoria is 2000 miles in length. The located line of the Siberian railway, from Chelyabinsk to Vladivostock is 4776 miles and the branch through Manchuria to Port Arthur will be 1273 miles, so that the system will commence before any feeders are built, with 6000 miles of line. The Siberian Railway is, like all Russian roads, of 5 feet gauge. It is constructed after the manner of American western railways, single-tracked, gravel-ballasted, with

Howe truss bridges over the smaller waterways, and steel bridges across the large rivers. In the country east of the Ural Mountains the rivers are deep, full-flowing streams, the alluvial bottoms of which necessitate large spans, and make it desirable to have as few bridge piers as possible. Floating ice is in the rivers for about seven months of the year. The bridge at the Ishim has openings amounting to 700 feet, that at the Tobal 1400 feet, that at the Irtysh 2100 feet, and the bridge over the Yenisei has a total length of almost 3000 feet. Lake Baikal is traversed by a steam ferry for a distance of some 40 miles. Forty bridges, each over 200 feet long, cross the tributaries of the Obi River between Omsk and Irkutsk. The Amur at Khabarovka is crossed by a steel bridge some 5000 feet in length. The total length of water crossings between Chelyabinsk and Vladivostock is given at 30.1 miles, exclusive of the 40 miles of ferry.

In Africa actual construction has been confined to short extensions of existing railways, of which there were 10,866 miles in operation at the end of 1898. Numerous railways are, however, projected and surveyed by the various governments which control African territory. The most important individual line is the much-talked-of "Cape to Cairo" combined railway and waterway line, which from Capetown to Alexandria is about 6000 miles long, of which about 5000 miles are railway. No material progress has been made toward carrying out the actual construction of this line. See "CAPE TO CAIRO" RAILWAY, and for account of Chinese railways see CHINESE EMPIRE.

In Japan, according to the last report of the Japanese Railway Bureau, there are 768 miles of state railway and 2652 miles of private railway, or a total of 3420 miles of railway of all classes. The building of private lines began in 1883-84, with 63 miles, and in 1898-99 the state and private lines in operation and under construction, or chartered, aggregated 5810 miles. In March, 1899, there were 58 incorporated railway companies, with a total paid-up capital of 238,775,000 yen, or \$118,909,950. Besides these, 26 new companies have been formed under provisional charters, with a total capital of 43,535,000 yen and a mileage of 809 miles. Of the 58 companies mentioned 42 are actually doing business, though only five of these companies operate more than 100 miles of road. These five larger companies operate 857, 315, 276, 207 and 147 miles of line, the Nippon Company heading the list. The average cost of construction per mile for state and private lines is given as follows in United States money:

Fiscal Year.	Lines.		Average.
	State.	Private.	
1897-98	\$34,789	\$24,887	\$27,127
1898-99	39,356	28,444	30,879

This increase in cost is the result of the general advance in the price of materials and labor. The total rolling-stock of the state and private lines in March, 1899, included 1103 locomotives, 3811 passenger cars, 14,088 freight cars. The most notable new construction now in progress is the extension of the state railway lines in the island of Yezo, which aggregates 598 miles, of which about 96 miles were completed in February, 1899. The Japanese government also proposes to rebuild the original Chinese railway line in Formosa, and to extend it, the work comprising in all about 200 miles of line, much of which is difficult construction. The construction will be carried on gradually.

One of the most important railway schemes now under way in South America is the extension of the Ferrocarril del Sur, of Ecuador, east and north from its present terminus at Puente de Chimbo to the city of Quito, about 231 miles. The surveys for this line have been completed, using 4 per cent. maximum grades and 20 per cent. maximum curves. The route will be mountainous, but as the line is narrow gauge, 3.28 feet, the work will not be heavy. At one part of its length the line will overcome an elevation of 8000 feet in 65 miles. The road is being built by American capital and American engineers.

In some respects the most interesting piece of railway construction of the year is the White Pass and Yukon Railway, built into the Klondike gold fields. This line is located to extend from Skagway, Alaska, to Fort Selkirk, Canada, 380 miles, and 41 miles from Skagway to Lake Bennett have been completed. From Skagway the line extends to Boulder, 5 miles with a 1 per cent. grade, but beyond this there is an almost continuous grade of 3.7 to 3.9 per cent. to the summit at White Pass, 20 miles from Skagway, the summit elevation being 2885 feet. A level stretch and some grades of 1 per cent. and 2 per cent. bring the line to Log Cabin, 32 miles, beyond which the line descends by a long grade of 3 per cent. to Lake Bennett. From Boulder to White Pass very heavy work was encountered, involving a large amount of rock excavation. In many places the slope of the mountain side along which the road ran was so steep that the men had to be secured by ropes while drilling the holes

for blasting away the rock. The road is 3 feet gauge, and is laid with 50-pound rails. It cost to construct \$60,000 per mile, and the capital was supplied by Americans. The construction of the road will be continued.

Grade Crossings.—The abolition of grade crossings of streets and railway tracks has been carried on actively in several cities during 1899. The railways entering the city of Chicago had up to the end of the year completed or commenced work involving the elevation of 60 miles of main line railway and 273 miles of track, and abolishing 416 crossings at grade. The total cost of this work had required the expenditure by the railways of over \$10,000,000. Other cities where considerable work has been done in abolishing grade crossings are Buffalo, Philadelphia, and Boston. The tendency is quite general in all cities throughout the eastern section of the country to require grade-crossing improvements, and the prosecution of this work is likely to form a considerable item in the expenditures of railway companies as time goes on.

Locomotives.—The increase in the size and weight of locomotives which has characterized the work of the last few years was continued during 1899. Since 1891 the average weight of American locomotives has increased 50 per cent. Late in 1899 the Lake Shore and Michigan Southern Railway and the Illinois Central Railroad put into operation, respectively, the largest ten-wheel passenger locomotive and the largest freight locomotive ever built. The weight and principal dimensions of these two engines compared with those of other heavy engines of corresponding classes are shown in the accompanying tables. A study of the locomotive dimensions and weights in the United States, given in these tables, in connection with the 80,000 pound and 100,000 pound cars and 2000-ton train loads, mentioned in preceding and succeeding paragraphs, shows very clearly the great train weights hauled on American railways at the present time:

During 1899 the contracting locomotive shops of America built 2473 locomotives, as compared with 1875 built in 1898. This is the largest number of locomotives ever built by these shops in a single year. The number of locomotives exported in 1899 by American builders was 514 as compared with 554 exported in 1898. The 554 locomotives built in 1898 were exported to over 30 foreign countries, and those sent abroad in 1899 were probably as widely distributed. Many of the locomotives exported in this last year have gone to England, France, and other European countries that are themselves extensive builders. In minor details of locomotive design and construction the year has shown steady advance. High boiler pressures of 200 to 210 pounds have been more commonly adopted, the size of boilers in relation to diameter of cylinders has continued to increase, more generous grate areas were adopted, cast-steel frames have been more largely used, piston valves were employed to an increasing extent, compound engines have continued to grow in favor and nickel steel has been extensively experimented with for boilers, stay bolts, and other parts.

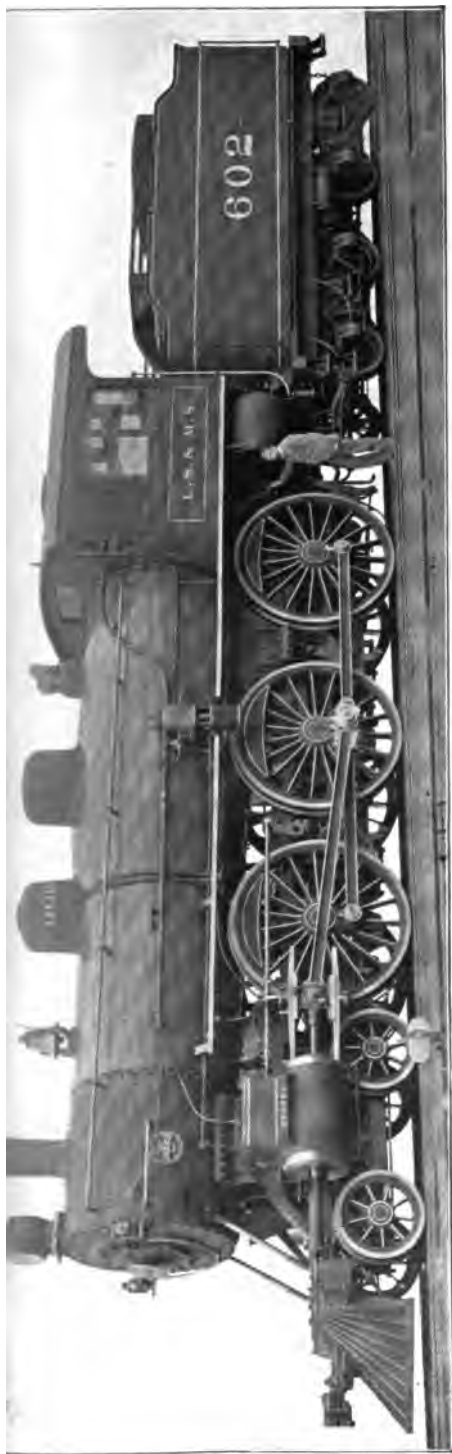
Road-Bed and Track.—Constantly increasing attention is being directed toward securing greater solidity and durability in railway permanent way and track construction. At the present time about one-sixth of the total cost of operating railways in the United States is expended on the care and maintenance of track, exclusive of bridges, culverts, fences, etc. In the year ending June 30, 1898, the railways of the United States expended \$81,360,000 in repairs to roadway, exclusive of \$10,662,000 for rail removals, and \$24,770,000 for tie removals. To reduce these figures by a more lasting construction is being made the subject of much thought by railway maintenance-of-way engineers throughout the country. Perhaps the most striking and radical proposition to secure this end is the proposed substitution of a solid concrete foundation, to which the rails are fastened directly. No attempts have been made to use such a construction, but the favorable discussion which it has met with from prominent railway engineers makes it one of the possibilities of the future. Sprinkling the ballast with oil to prevent flying dust has been practised to an increasing extent during the year. The oil used is a residuum of crude petroleum, having a high fire test, low gravity, and faint smell. The sprinkling is done with a tank car, fitted and operated like an ordinary street sprinkler. The first application requires about 2000 gallons per mile, after which 500 to 600 gallons per mile per year will suffice to keep the ballast dustless. Increasing attention has been given to the preservation of wood ties by preservatives. The preservatives most commonly employed are creosote (dead oil of coal tar) and chloride of zinc, which are forced into the pores of the wood until the tie is thoroughly impregnated. The use of steel ties has continued to increase in Europe and other foreign countries, but is making little if any progress in America. In rails, rail fastenings, rail joints, switches, frogs, etc., very little that is new developed during 1899. Iron is being quite extensively used as a substitute for wood in track signs, fencing, etc. In handling material, such as rails, ballast, etc., the principal progress has been in the increasing use of mechanical means, such as ballast unloaders, track pile-drivers, rail-sawing machines, etc., mounted on cars so as to be transported from place to place, where work is being

DIMENSIONS OF HEAVY FREIGHT LOCOMOTIVES.

RAILWAY.....	ILLINOIS CENTRAL.		UNION.	GREAT NORTH-ERN.	SOUTHERN PACIFIC.	NORTHERN PACIFIC.	C., C. & St. L.	Buf. R. & Pitts.
	12-wheel.	Consolidation.						
BUILDER.....	Brooks.	Rogers.	Pittsburg.	Brooks.	Schenectady.	Schenectady.	Richmond.	Brooks.
Driving wheels.....	4 ft. 9 ins.	4 ft. 9 ins.	15 " 7 "	4 ft. 7 ins.	4 ft. 7 ins.	4 ft. 7 ins.	4 ft. 8 ins.	4 ft. 7 ins.
Wheelbase, driving.....	15 " 9 "	15 " 9 "	15 " 7 "	15 " 10 "	15 " 6 "	15 " 6 "	16 " 3 "	15 " 6 "
Weight on drivers.....	24 " 6 "	24 " 5 "	24 " 0 "	26 " 8 "	26 " 5 "	26 " 4 "	24 " 2 "	25 " 5 "
Total.....	133,200 lbs.	104,000 lbs.	208,000 lbs.	172,000 lbs.	155,000 lbs.	150,000 lbs.	102,000 lbs.	148,000 lbs.
Weight on tender.....	232,200 "	214,000 "	230,000 "	212,750 "	192,000 "	186,000 "	180,000 "	175,000 "
Total.....	365,400 "	318,000 "	438,000 "	384,750 "	347,000 "	336,000 "	300,000 "	323,000 "
Engine and tender.....	Simple.	Simple.	Simple.	Simple.	2-cylinder compd.	2-cylinder compd.	Simple.	Simple.
Cylinders.....	23 x 30 ins.	23 x 30 ins.	23 x 32 ins.	21 x 34 ins.	23 and 35 x 32 ins.	23 and 34 x 30 ins.	22 x 30 ins.	21 x 26 ins.
Boiler diameter.....	6 ft. 8 ins.	6 ft. 8 ins.	6 ft. 8 ins.	6 ft. 6 ins.	6 ft. 6 ins.	6 ft. 6 ins.	6 ft. 6 ins.	5 ft. 6 ins.
Pressure.....	11 ft. x 3 ft. 6 ins.	11 ft. x 3 ft. 6 ins.	10 ft. x 3 ft. 4 ins.	10' 4" x 3' 4 1/2"	10 ft. x 3 ft. 6 ins.	10 ft. x 3 ft. 6 ins.	9' 11" x 3' 5"	9 1/2 ft. x 3 ft. 3 1/4 ins.
Firebox No.....	424	417	355	376	339	339	376	324
Tube No.....	9 ins.	9 ins.	9 1/2 ins.	9 1/2 ins.	9 1/2 ins.	9 1/2 ins.	9 1/2 ins.	9 ins.
Diameter.....	14 ft. 8 3/4 ins.	13 ft.	13 ft.	13 ft. 10 1/2 ins.	14 ft. 6 ins.	14 ft. 6 ins.	13 ft. 5 ins.	12 ft. 7 1/2 ins.
Length.....	3,227 sq. ft.	3,231 sq. ft.	3,177 sq. ft.	3,043 sq. ft.	2,819 sq. ft.	2,731 sq. ft.	2,623 sq. ft.	2,406 sq. ft.
Heating surface, tubes.....	3,500 "	3,203 "	3,229 "	3,025 "	2,825 "	2,743 "	2,600 "	2,331 "
Total.....	37 1/4 "	36 1/4 "	35 1/2 "	34 "	33.00 "	33.00 "	33.88 "	30.4 "
Grate area.....	7,000 gallons.	5,000 gallons.	.....	4,670 gallons.	4,500 gallons.	4,000 gallons.	6,000 gallons.	4,500 gallons.
Water in tank.....	23,800 lbs.	20,000 lbs.	.....	22,400 lbs.	22,400 lbs.	15,000 lbs.	22,400 lbs.	18,000 lbs.
Coal on tender.....	.....	.....	.....	.....	.....	.....	.....	.....

DIMENSIONS OF HEAVY TEN-WHEEL PASSENGER LOCOMOTIVES.

RAILWAY.....	L. S. & M. S.	GRAND TRUNK.	N. Y. CENTRAL.	DEN. & R. GRANDE.	SOUTHERN.	ATCHE., T. & S. F.	FITCHBURG.	BALT. & OHIO.
BUILDER.....	Brooks.	Schenectady.	Schenectady.	Brooks.	Richmond.	Dickson.	Baldwin.	Baldwin.
Driving wheels.....	6 ft. 8 ins.	6 ft.	5 ft. 10 ins.	5 ft. 3 ins.	6 ft.	6 ft. 1 in.	6 ft. 6 ins.	6 ft. 6 ins.
Wheelbase, driving.....	16 " 6 "	15 ft. 6 ins.	14 " 8 "	13 ft.	14 ft. 7 ins.	15 ft.	14 " 6 "	13 " 8 "
Weight on drivers.....	27 " 4 "	26 " 11 "	26 " 8 "	28 ft. 7 ins.	26 " 1 in.	25 ft. 2 ins.	26 " 8 "	24 " 6 "
Weight on tender.....	133,000 lbs.	125,000 lbs.	126,000 lbs.	134,000 lbs.	131,250 lbs.	125,800 lbs.	111,000 lbs.	113,000 lbs.
Total.....	171,600 "	166,000 "	164,000 "	164,000 "	138,000 "	156,800 "	150,000 "	147,000 "
Engine and tender.....	Simple.	Simple.	Simple.	Simple.	Simple.	Simple.	4-cyl. compound.	Simple.
Cylinders.....	20 x 28 ins.	20 x 28 ins.	20 x 28 ins.	21 x 28 ins.	21 x 28 ins.	19 1/2 x 28 ins.	15 and 25 x 26 ins.	21 x 26 ins.
Boiler diameter.....	5 ft. 6 ins.	5 ft. 6 ins.	5 ft. 6 ins.	5 ft. 8 ins.	5 ft. 1 in.	4 ft. 11 ins.	5 ft.	5 ft.
Pressure.....	10' 1" x 3' 5"	9 ft. x 3 ft. 4 ins.	9 ft. x 3 ft. 4 ins.	10' 7" x 3' 5"	10 ft. x 3 ft. 6 ins.	7' 4" x 3' 9"	10 ft. x 3 ft. 5 ins.	10 ft. x 3 ft. 5 ins.
Firebox.....	210 lbs.	200 lbs.	200 lbs.	210 lbs.	200 lbs.	180 lbs.	200 lbs.	180 lbs.
Tube No.....	245	201	240	236	235	264	235	231
Diameter.....	9 ins.	9 ins.	9 ins.	9 ins.	9 1/2 ins.	9 1/2 ins.	9 ins.	9 1/2 ins.
Length.....	15 ft. 4 in.	15 ft.	14 ft. 4 in.	13 ft. 4 in.	14 ft. 5 ins.	14 ft. 10 ins.	13 ft. 1 in.	14 ft. 7 1/2 ins.
Heating surface, tubes.....	2,694 sq. ft.	2,270 sq. ft.	2,270 sq. ft.	2,270 sq. ft.	2,317 sq. ft.	1,795 sq. ft.	2,375 sq. ft.	1,970 sq. ft.
Grate area.....	3,217 "	2,470 "	2,480 "	2,480 "	3,410 "	1,980 "	2,748 "	2,194 "
Water in tank.....	53.6 "	53.4 "	50.3 "	53.6 "	35 "	35 "	34.5 "	34.5 "
Coal on tender.....	5,000 gallons.	4,500 gallons.	4,500 gallons.	5,000 gallons.	4,500 gallons.	4,650 gallons.	4,000 gallons.	4,000 gallons.
Coal on tender.....	19,000 lbs.	20,000 lbs.	20,000 lbs.	19,000 lbs.	14,000 lbs.	16,000 lbs.	16,000 lbs.	7,314 lbs.



RAILWAYS.—1. The Heaviest Passenger Locomotive ever Built; Lake Shore and Michigan Southern Railway. 2. The Largest Locomotive in the World; Twelve-wheel Freight Locomotive; Illinois Central R. R.

done. Two railways, the Canadian Pacific and the Northern Pacific, have done a considerable amount of work in filling in trestles by the hydraulic method. In this method a stream of water is brought in pipes to the work, where it is thrown through nozzles in powerful jets against some adjacent hillside, and thus washes down the earth which is carried away with the water by a flume discharging under the trestle being filled in. Where the conditions are suitable for the operation of this method it has proved very efficient.

Shops.—In railway shop practice the year has shown a continuation of the tendency of recent years toward better designing and construction of shop buildings. Central power stations supplying electrical power to shop motors operating single tools or groups of tools are being adopted, and in the shops power-hoisting and conveying devices are being used more and more. In car shops a change is being slowly introduced because of the increasing use of steel cars requiring entirely different tools and labor than are used in repairing wooden cars.

Signalling.—Substantial progress was made during 1899 in railway, block, and interlocking signalling in the United States. Green lights are now pretty generally used instead of white for the clear signal. The color for distant signals is unsettled in actual practice. One prominent railway uses red for danger, green for clear, and yellow for caution. Various improvements have been made to secure better and more durable construction of signalling apparatus. The one field in which there is an increasing demand for better signalling arrangements is on electric railways, and very little advance has been made in this class of signalling.

Traffic.—During 1899 railways were pushed to their utmost to handle the business offered them, and earnings showed a steady increase throughout the year. All sections of the country participated in the improved conditions, but the trunk lines carrying cereals to the seaboard, and particularly the lines handling coal and ore, enjoyed the greatest increase in business. As a whole rates were fairly well maintained, but they were low. Passenger business as well as freight showed a decided improvement during 1899 over the preceding twelve months.

Train Weights.—A notable feature of railway operations in 1899 has been the continued increase in the weight of the heaviest trains hauled. The record is now held by the Baltimore and Ohio Railroad, which in May hauled a train of 50 cars, containing 98,000 pounds of coal each, or 4,900,000 pounds total net load, from Cumberland to Brunswick, Md., 100 miles. The total gross weight of this train was 6,843,700 pounds. The Illinois Central Railroad has recently installed equipment for handling regular net loads of 2000 tons; the Pittsburg, Bessemer and Lake Erie Railroad has hauled during the year average train loads of 1644 tons net or 2137 gross behind the tender; the New York Central and Hudson Railroad's new equipment is planned to handle regular trainloads of 2400 tons net. The handling of these enormous loads has been made possible by the great increase in the size of cars and locomotives, and it has resulted in reducing rates on bulk freights to a very low figure. It is estimated by competent authorities that a rate of .1 cent per ton mile for handling such freight is a possibility of the near future. See BRIDGES and TUNNELS.

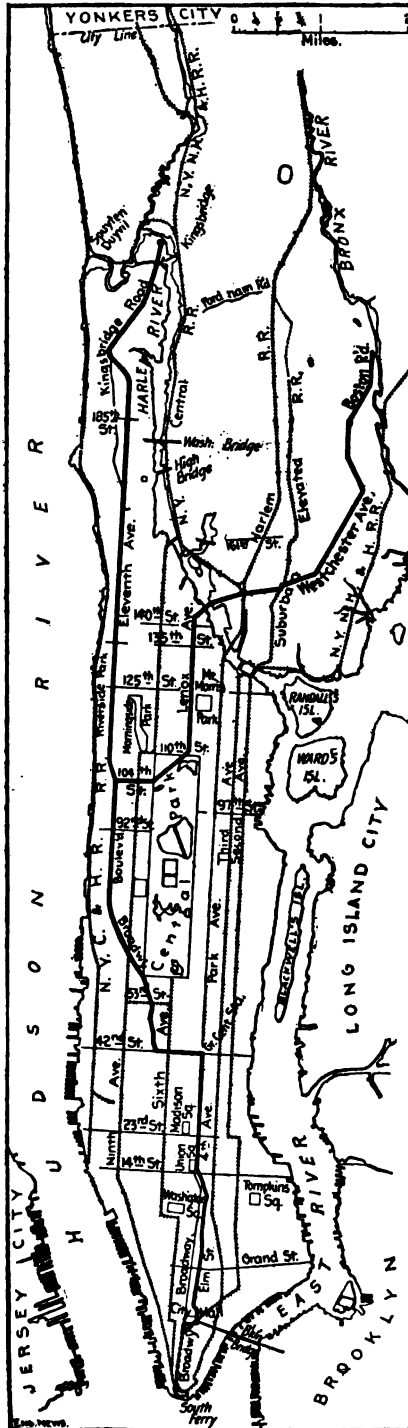
RAILWAY SURGEONS, AMERICAN ACADEMY OF, founded in 1894, had in 1899 a membership of 151; publishes annual *Transactions*. The general meeting for 1900 is to be in St. Paul, Minn., September 5 and 6. President, Dr. C. A. Wheaton, St. Paul, Minn.; secretary, Dr. T. B. Lacey, Council Bluffs, Ia.

RANDOLPH-MACON SYSTEM OF COLLEGES AND ACADEMIES consists of Randolph-Macon College, at Ashland, Va., opened in 1832, and the Randolph-Macon Academies, opened one at Bedford City, Va., in 1890, another at Front Royal, Va., in 1892, for men, and the following for women: Randolph-Macon Woman's College, at Lynchburg, Va., opened 1893, and the Randolph-Macon Institute, at Danville, Va., opened 1897. The system has endowments of about \$750,000, and received in 1899 gifts of money amounting to \$41,000. In 1899 there were in the system 59 officers of instruction and administration and 630 students. The library had 17,000 bound volumes. Chancellor, William W. Smith, A.M., LL.D.

RANNEY, AMBROSE ARNOLD, ex-member of Congress, died March 5, 1899. He was born at Townshend, Vt., April 16, 1821; was graduated at Dartmouth in 1844, and in 1848 was admitted to the bar, after which he practised in Boston. He was there city solicitor in 1855-56, and in 1857, 1863, and 1864 served in lower house of the Massachusetts legislature. From 1881 to 1887 he was a Republican member of Congress.

RAPID TRANSIT. The rapid transportation of passengers in large cities is usually accomplished either by surface street railway lines, now generally operated by electric power; or by elevated railway lines, operated by steam or electric power; or by underground lines, through subways or tunnels, operated in all recent construction by electric power. See ELECTRIC STREET RAILWAYS.

Elevated Railways.—New York City was the first American city to build elevated railways on an extensive scale,



MAP SHOWING ROUTE OF NEW YORK UNDERGROUND RAPID-TRANSIT RAILWAY. (From *Engineering News*.)

and there are now about 66 miles of elevated railway in operation in the boroughs of Manhattan, Brooklyn, and the Bronx. The city of Chicago has about 40 miles of elevated railway in operation, and the city of Boston has 7 miles in process of construction. All of the Chicago lines are now operated by electric power, and the new Boston line will use the same method of propulsion for its trains. In the city of New York steam locomotives are still used on the greater proportion of the elevated lines, but all of them are either in the process of being changed to electric power or have completed arrangements for making the change at an early date. A portion of the New York Rapid Transit Railway will be elevated structure. (See paragraph Underground Railways below.) In Liverpool, England, there is an elevated railway 6.4 miles long, double tracked, operated by electricity. This was the first elevated railway built to operate by electric power. These are the only elevated railways of much importance now in operation in the world. The most recent elevated railways to be constructed are the Northwestern Elevated in Chicago, 7 miles long, and the new Boston elevated line, 7 miles long. Both of these roads follow practically the same lines structurally. The supporting columns are placed on the curb lines, and are connected at their tops by a deep-plate girder extending transversely across the street. Longitudinally, these cross girders are connected by two pairs of plate girders, each pair of girders carrying one track. This construction is in its general features the standard modern construction for elevated railways over public streets. Compared with the original construction of elevated railways in New York it is more simple and substantial, and follows more nearly present engineering practice in structural steel design, details and construction. Elevated railways when operated by electricity take the power in all cases from a third rail. Both the Northwestern Elevated and the Boston Elevated railways belong to the construction of 1899.

Underground Railways.—Underground rapid transit railways were under construction in 1899 in London and Paris, and plans were finally completed and bids asked during the same year for the construction and operation of the New York Rapid Transit Underground Railway lengthwise of Manhattan Island. The lines under construction in London were the Central London, and a road two

miles long from Baker Street Station to Waterloo Station, crossing under the Thames River. This last line, like the Central London, will be operated by electric power. The Paris underground lines were fully described in the YEAR BOOK for 1898.

The New York Rapid Transit Underground Railway, as planned for present construction, starts from a loop which encircles the triangular area occupied by the City Hall Park and the post-office. Within this loop the tunnel construction will be two storied, but where the main line leaves the loop all four tracks will come to the same level and continue side by side thereafter, except at the points which will be noted as the description proceeds. Proceeding from the loop, the four-track line passes under Centre and Elm Streets, and a few blocks of private property, and reaches Fourth Avenue at about Ninth Street. From this point, Fourth Avenue and Park Avenue are the routes pursued until Forty-second Street is reached, when the line turns west along Forty-second Street, which it follows to Broadway. Broadway and the Boulevard (now renamed Broadway) are then followed until Ninety-seventh Street is reached, when the four-track line is separated into two double-track lines. The four-track line, between the post-office and Ninety-seventh Street, will be known as the main line. In this portion the two inside tracks will be used by express trains, stopping only at comparatively long distances, and the outside tracks will be used by local trains, stopping at stations about $\frac{1}{4}$ mile apart. At about Ninety-sixth Street, on the main line, suitable crossovers will be provided, so as to permit trains to pass at will between the northbound local and express tracks, and also between the southbound local and express tracks. At a suitable point north of these crossovers the outside tracks will rise so as to permit the inside tracks, on reaching One Hundred and Third Street, to curve to the right and pass under the right-hand outside track. The inside and the outside tracks then take separate routes north as double-track lines. The inside tracks, which run to the right at One Hundred and Second Street, continue east and north to Bronx Park, passing under a portion of Central Park and under the Harlem River in the route. This branch will be known as the East Side Line. The outside tracks turn slightly to the left from the point of separation, and then continue along a route generally parallel to the North River, through Spuyten Duyvil to about Two Hundred and Thirtieth Street. This branch will be known as the West Side Line. At one point between One Hundred and Twenty-third and One Hundred and Thirty-fifth Streets, the West Side Line will rise to the surface and pass over a depression, on elevated structure or viaduct, and for a considerable distance both this and the East Side Line will be pure elevated railway construction. This elevated construction and viaduct, the tunnels under the Harlem River, under Central Park, and under the present Fourth Avenue tunnel, the post-office loop, and the Ninety-sixth Street crossovers call for special modifications of construction. Except at these points the construction will conform closely to a single standard construction adapted to four-track and two-track lines. This construction consists of a concrete floor upon which is erected a framework of steel columns and roof-beams carrying side-walls, and a roof of concrete.

READING, PSYCHOLOGY OF. See PSYCHOLOGY OF READING.

RED CROSS SOCIETY, THE AMERICAN NATIONAL, incorporated 1881, and reincorporated 1893, to furnish relief in war, famine, pestilence, floods, or other great calamity; in time of war acts under protection of the provisions of the Geneva treaty. This society rendered valuable services in the Spanish-American War in 1898, and in the Anglo-Boer War in 1899. President, Clara Barton; general secretary, Walter P. Phillips; headquarters, Washington, D. C.

REED, THOMAS BRACKETT, announced his retirement from political life on April 20, 1899. Elected to every Congress from the Forty-fifth to the Fifty-sixth inclusive, he served in all but the last. As speaker of the Fifty-first, Fifty-fourth, and Fifty-fifth Congresses, Mr. Reed established a reputation for arbitrary ruling, which though often disagreeable to various members of the House seemed, nevertheless, to make for better and more efficient legislation. Had he not resigned his seat there is little doubt that he would have been speaker of the Fifty-sixth Congress. Unlike many other politicians and statesmen, he made little money out of public office, and his resignation was due, it was said, to the fact that he felt constrained to secure a larger income for the sake of his family. He changed his residence from Portland, Me., to New York City, where he entered a law firm and began a lucrative practice. His successor as speaker of the House is Mr. David B. Henderson, of Iowa. Mr. Reed was born in Portland, October 18, 1839. Being graduated from Bowdoin in 1860, and admitted to the bar in 1865, he began the practice of law in his native city. Beginning in 1868, he served successively in the lower and upper houses of the Maine legislature, was attorney-general of the State, city solicitor of Portland, and in 1877 first represented the first Maine district in Congress. In 1896 he was a prominent candidate for the Republican Presidential nomination. By both friend

and foe in politics he has been recognized as one of the foremost contemporary American statesmen. He does not agree with the "expansion" policy of the McKinley administration.

REES, Sir JOSIAH, chief justice, and judge of the vice-admiralty court of Bermuda, died November 4, 1899. He was born in 1821 in London, was educated at University College in that city, and became a barrister in the Middle Temple in 1851. After a successful career in English courts, he was appointed in 1878 to the position held by him at the time of his death. He was knighted in 1891.

REFORMED CHURCH IN AMERICA (DUTCH) reports a year of quiet progress. The general synod met at Catskill, N. Y., in June, 1899, and filled two vacancies in the faculty of the Theological Seminary at New Brunswick, N. J., caused by the death of Dr. D. D. Demarest, and the resignation of Dr. J. G. Lansing. This church has 86 missionaries in China, India, Japan, and Arabia, with 42 churches, 4458 communicants, 6 hospitals and dispensaries, the work being carried on at an expense of \$134,672. The Dutch Reformed Church in 1899 had 724 ministers, 619 churches, and 109,361 communicants. The latest report of the United States commissioner of education shows that the Reformed Church has 8 institutions of learning, with 98 professors, 708 students, and endowment funds aggregating \$1,407,830.

REFORMED CHURCH IN THE UNITED STATES (GERMAN). The important event of the year 1899 in this body, was the meeting of the general synod on May 23, at Tiffin, O., where \$40,000 was appropriated for foreign missions. Successful home mission work is carried on among the Hungarians and Bohemians in the United States. Three new missionaries were sent to Japan and China. *The History of the Reformed Church in the United States* was published during the year. This body reports for the year, 1049 ministers, 1677 congregations, and 240,130 communicants.

REFORMED EPISCOPAL CHURCH in the United States in 1899 had 7 bishops, 103 ministers, 104 churches, and about 9000 communicants. The fifteenth general council will be held in Baltimore, Md., June 6, 1900. The bishops are: Charles Edward Cheney, Chicago, Ill.; William R. Nicholson, Philadelphia, Penn.; Edward Cridge, Victoria, British Columbia; Samuel Fallows, Chicago, Ill.; P. F. Stevens, Orangeburg, S. C.; James A. Lalane, Baltimore, Md., and Edward Wilson, Metuchen, N. J.

REFORMED PRESBYTERIANS. The General Synod reports for 1899, 44 ministers, 50 churches, and 5000 members. The synod of India reports 113 ministers, 124 churches, and 9875 members. The denomination carries on missionary work in India, Syria, Asia Minor, Cyprus, and China, and has mission schools for freedmen in Selma, Ala., for Indians at Fort Sill, Okla., for Chinese in Oakland, Cal., and for Jews in Philadelphia and Cincinnati.

REGENERATION. See BIOLOGY.

RELAPSING FEVER. See INSECTS AND THE PROPAGATION OF DISEASES.

REPUBLICAN LEAGUE OF THE UNITED STATES, NATIONAL, organized in 1887 for the recruiting of the Republican party. Yearly conventions are held. President, George Stone; secretary, D. H. Stine, Newport, Ky. Headquarters, Auditorium Hotel, Chicago, Ill.

REUNION ISLAND, a French possession, lies in the Indian Ocean about 420 miles east of Madagascar. Its area is 965 square miles, and its estimated population is 171,713, made up principally of natives of British India, Madagascar, and Africa, and a few hundred Chinese. It is represented in France by a senator and two deputies. The trade of Reunion is quite important, the exports in 1896 being 18,100,000 francs, of which 96 per cent. went to France, and the imports 19,189,637 francs, of which 55 per cent. came from France. In 1897 French imports into Reunion amounted to 19,477,945 francs, and she received exports from Reunion valued at 20,678,910 francs. The principal products are sugar, coffee, cacao, vanilla, and spices. The principal port is Pointe-des Galets, which is connected with St. Benoit and St. Pierre by a railway 78 miles in length. In 1899 Ranavalo, the former queen of Madagascar, who had been exiled to Reunion, was sent to Algiers, since authorities believed the island to be too near her former home. A pension of 25,000 francs is granted to her by the French government.

REUTER, PAUL JULIUS VON, Baron of the Duchy of Saxe-Coburg and Gotha, died at Nice, February 25, 1899. He was known throughout the civilized world as the founder of Reuter's Telegram Company, the most important European organization for the collection and dissemination of news. He was born at Cassel, Germany, July 21, 1821. He became connected with a banking house in Göttingen, and in 1847 entered a book business in Berlin. From the time of its introduction into Europe he sought to utilize the electric telegraph system for the transmission of news, and

in 1849, upon the completion of the line from Berlin to Aix-la-Chapelle, he established in the latter place the first central bureau for the collection and dissemination of telegraphic news. As other lines were completed his system developed and increased in efficiency. The telegraphic cable between Calais and Dover was laid in 1851, and thereupon Reuter transferred his central agency to London, becoming himself a naturalized British subject. As soon as possible he established agencies throughout the civilized world, with the result that the British press excelled all other publications in the prompt setting forth of important events connected with politics, commerce, science, etc. The agency supplied news indiscriminately to the various papers; this fact was an important factor in the development of the penny press. In order to secure patronage in other countries, and thus adjust more equitably the expenses of the company, Reuter established branch agencies in the countries of Europe, in North and South America, India, Egypt, China, and the West Indies. The prompt and efficient service of the agencies during the American Civil War and the Franco-Prussian War won for the company general confidence, which, it is said, it has since maintained. In 1865 the business was converted into a limited liability company; Reuter continued as manager until 1878, when he resigned, but retained his place in the board of directors. The company is affiliated with the Associated Press in America. The title of baron was conferred upon him in 1871. The next year he attracted attention through a concession granted him by the Shah of Persia, by the terms of which he was given the exclusive privilege of constructing railroads, utilizing the natural resources of the country, including the exploitation of mines and forests, and collecting the customs for a percentage.

REYNOLDS, JOSEPH JONES, brevet major-general, U.S.A., retired, born at Flemingsburg, Ky., January 4, 1822, died in Washington, D. C., February 26, 1899. Appointed to the Military Academy at West Point from Indiana, he was graduated in 1843. He was stationed at various military posts, taught from 1846 to 1855 at West Point, and was professor of mechanics and engineering at Washington University, St. Louis. After the outbreak of the Civil War he entered the Union volunteer service as colonel of the Tenth Indiana, was rapidly promoted, and in 1862 became a major-general, U.S.V. He served in West Virginia, and in 1863 was chief of staff of the Army of the Cumberland. He was engaged in the battles at Hooker's Gap, Chickamauga, and Chattanooga. From January to June, 1864, he commanded the defences of New Orleans, and was there given command of the Nineteenth Army corps. In the same year, from October to December, he was over the forces from Memphis to the mouth of the Mississippi. He had command of the Department of Arkansas. He assisted in organizing forces for the capture of Mobile, Fort Gaines, and Fort Morgan. In 1866 he was mustered out of the volunteer service and was appointed colonel in the regular army. In the following year he was brevetted brigadier-general, U.S.A., for gallant and meritorious services at Chickamauga, and major-general, U.S.A., for similar work at Missionary Ridge. In June of this year (1877) he was retired.

RHODE ISLAND, a New England State, has an area of 1250 square miles. The capitals are Providence and Newport.

Mineralogy.—Granite quarrying continued to show declining results through the greater part of 1898; but toward the close of the year a marked change for the better took place, giving much brighter prospects than usual for 1899. In 1898 the value of the output fell to \$320,242, a decline in a year of \$309,322. The uses of the stone were: Sold in the rough, \$43,505; dressed for building purposes, \$40,987; dressed for monumental work, \$204,739; and cut into paving-blocks, \$19,510. In limestone also there was a heavy fall, the output being valued at \$10,215 only, the smallest production in many years. The total amount was burned into lime.

Manufactures.—Rhode Island is included in the internal revenue collection district of Connecticut, and the principal details of its taxable manufactures are combined with those of that State. The collections for the State separately aggregated \$1,116,234. There were 69 cigar factories, which had an output in the calendar year 1898 of 4,898,365 cigars, and 3 fruit distilleries in operation, which produced 794 gallons of grape brandy. Rhode Island produced all the oleomargarine manufactured in the district, a total in the fiscal year 1898-99 of 7,912,571 pounds, of which 2,283,455 pounds was for export account. In January, 1899, a long-rumored deal, whereby the syndicate, headed by Joseph Leiter, of Chicago, became the owner of the Rhode Island Locomotive Works in Providence, was effected. It was understood that the works would be operated by the International Air Power Company, composed of American and British capitalists; that the manufacture of steam locomotives and steam-engines would be continued; that the Greene-Wheelock engine plant would be returned to Providence from Worcester; and that the company, in addition, would manufacture compressed-air locomotives, carriages and coupés,

trucks, truck bodies, and compressed-air machinery for use in the United States and Europe.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise in the customs districts of Bristol and Warren, Providence (\$860,392), and Newport, aggregated in value \$877,840; exports, all at Providence, \$2974, making the total foreign trade of the year \$880,814, an increase in a year of \$194,030, chiefly in imports.

Banks.—On October 31, 1899, there were 56 national banks in operation and 8 in liquidation. The active capital aggregated \$17,740,200; circulation, \$7,415,950; deposits, \$26,100,142; and reserve, \$7,516,286. The State banks, November 17, 1898, numbered 6, and had capital, \$916,675; deposits, \$765,225; resources, \$1,892,767; and undivided profits, \$144,774; loan and trust companies, 8, with capital, \$2,852,262; deposits, \$23,214,799; and resources, \$28,571,031; and mutual savings banks, 35, with depositors, 140,815; deposits, \$70,589,065; resources, \$74,156,559; and surplus, \$3,545,495.

Education.—The school census of 1898 showed a total enumeration of 79,299. At the close of the school year 1897-98 the public school enrolment was 65,384, and the average daily attendance, 47,370. There were 1852 teachers, 525 buildings used as school-houses, and public school property valued at \$4,579,334. The revenue was \$1,485,604; expenditure, \$1,717,492, of which \$989,267 was for teachers' salaries. There were 16 public high schools, with 155 secondary teachers and 3149 secondary students; 13 private secondary schools, with 116 teachers, 762 secondary students, and 612 elementary pupils; and 1 public normal school, with 19 teachers and 218 students in all departments. Normal training was also given in 1 college and 1 private secondary school. Brown University reported 1 fellowship, 100 scholarships, 72 professors and instructors, 860 students, 100,000 volumes in the library, valued at \$220,000; \$340,000 invested in scientific apparatus, \$1,177,967 in grounds and buildings, and \$807,481 in productive funds; \$131,752 in total income, and \$13,800 in benefactions. The vacancy in the presidency of the university was filled June 3, 1899, by the election of the Rev. William H. P. Faunce, D.D., of New York, who formally assumed his duties on September 20. In 1899 there were 62 periodicals, of which 14 were dailies, 33 weeklies, and 10 monthlies.

Railways.—There was no new railway construction either in 1898 or 1899, and the present total mileage is 223.03, according to the reports adopted for this volume, or 479, as claimed locally.

Finances.—The assessed valuations for 1898 were: Real estate, \$308,967,317; personal property, \$81,945,263—total, \$390,912,580; tax rate, \$1.80 per \$1000. The total funded debt, January 1, 1899, was \$2,300,000; sinking funds, \$255,089—net debt, \$2,044,911. The sinking fund receives \$50,000 annually, and invests its receipts from all sources in bonds and notes of the cities, towns, and districts of the State. Providence had an assessed valuation in 1899 of \$188,501,780, and net debt of \$13,882,404; and Newport, valuation, \$38,121,300, and net debt, \$639,850.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 418,000.

Legislation.—It was enacted that commercial foodstuffs shall be labelled as to quantity and quality. A State commission is to be appointed by the governor to protect birds and prosecute those molesting them. Kidnapping was made a felony. It was provided that juvenile offenders must be kept separate from adults. Primary elections and caucuses are regulated; every political party shall elect a State committee. Insurance companies must pay a tax of 2½ per cent. on gross incomes received on property insured within the State.

Elections.—A Republican governor and a Republican legislature were elected on April 5, 1899, and on May 30 Governor Elisha Dyer was inaugurated for a third term. Governor Dyer received 24,308 votes; the Democratic candidate, Mr. Greene, 14,602 votes; Mr. Herrick (Soc. Lab.), 2941; and Mr. Peckham (Pro.), 1279 votes. The whole vote cast was 43,130, and Governor Dyer's plurality, 9706. A proposed revision of the constitution of Rhode Island was submitted to the people on June 20, and rejected by a vote of 11,549 to 4714.

State Officers and National Representatives.—Governor, Elisha Dyer; lieutenant-governor, William Gregory; secretary of state, Charles P. Bennett; attorney-general, W. B. Tanner; general treasurer, Walter A. Read; adjutant-general, F. M. Sackett; auditor, Charles C. Grey; superintendent of education, T. B. Stockwell. Supreme Court: Chief justice, Charles Matteson; associate justices, John H. Stiness, Pardon E. Tillinghast, George A. Wilbur, Horatio Rogers, W. W. Douglas, Edward C. Dubois; clerk, B. S. Blaisdell. The State legislature consists of 90 Republicans, 19 Democrats, and 1 Prohibitionist. Senators, George P. Wetmore, from Newport; and Nelson W. Aldrich, from Providence—both Republicans. Representatives, Melville Bull, from Newport; and Adin B. Capron, from Smithfield—both Republicans.

RHODES, Cecil, South African capitalist, was born July 5, 1853. He was educated at Oriel College, Oxford, and for a time studied law at the Inner Temple, London. Left by his brother in charge of the diamond mines at Kimberley, South Africa, Mr. Rhodes acquired a large fortune. He turned his attention to politics, and entered the Cape Parliament for West Barkly. About this time he refused General Gordon's offer to accompany the proposed expedition to Khartoum, and accepted the post of treasurer-general in the Scanlan cabinet in South Africa. Soon he became concerned in difficulties with the Boers regarding Bechuanaland, and checkmated Kruger's advance upon that portion of South Africa. He then formed the De Beers Consolidated Mines, and in 1886, when gold was discovered in the Transvaal, organized the company known as the Gold Fields of South Africa. Fearing that the Boer republic would overrun territory which he hoped to see under British rule, he formed the British South Africa Company, and succeeded in obtaining a charter. Of this company he was chairman until 1896. When Kruger sent agents to Matabeleland, Cecil Rhodes arranged a mission to Lobengula, which resulted in the Moffat treaty of 1888. He secured interests in the South African Lake Company and brought the De Beers Company and the British South Africa Company together, obtaining a royal charter for the area of a million square miles, comprising Rhodesia (Mashonaland and Matabeleland), Bechuanaland, and British Central Africa. Dr. Jameson undertook his mission to Matabeleland about this time. In 1890 Mr. Rhodes became prime minister of Cape Colony, remaining until 1896, when he resigned on account of the Jameson raid into the Transvaal. When a second revolt of the Matabele occurred, and a general massacre of the white settlers was contemplated, Mr. Rhodes took command of a body of men at Salisbury and defeated the Matabele at Givelo. In 1896 he went to meet the native chiefs alone and unarmed, and they surrendered. In 1897 he visited England, where he received an ovation, and returned in the same year to South Africa. He went to Buluwayo with Earl Grey to negotiate with the native chiefs relative to stopping the fighting in Mashonaland. In 1897 he was returned to Parliament for both Barkly West and Namaqualand, but chose to sit for his old constituency. In 1899 he visited England to secure government charter for the railway he proposes between Buluwayo and Lake Tanganyika; but a greater scheme is that of a proposed railway from Cape Town to Cairo. (See "CAPE TO CAIRO" RAILWAY.) In March he went to Egypt to confer with Lord Kitchener regarding this project. Oxford conferred upon him the degree of D.C.L. in June, 1899. He went to Kimberley when the war with the Transvaal broke out in October, 1899, and raised and equipped a town guard of 400 men at a cost of £15,000. He predicted that he would be in London in June, 1900. Mr. Rhodes appears to be one of the most successful English financiers and capitalists. The aim of his life may be said to be British territorial expansion. He frequently sweeps his hand over the map of Africa from the Cape to the Zambesi, saying: "That's my dream—all English!" At the close of 1899 he was among the besieged English in Kimberley.

RHODESIA is a name for a large tract of territory, comprising some 750,000 square miles, administered by the British South Africa Company. The river Zambesi flows eastward through the territory, dividing it into Northern Rhodesia and Southern Rhodesia. The former includes the whole of British Central Africa, a section of which, fronting on Lake Nyassa, has been formed into a protectorate under imperial control. Southern Rhodesia includes what was formerly known as British South Africa, and embraces the two provinces known as Mashonaland and Matabeleland, lying roughly between the Zambesi and Limpopo rivers, and in addition, that part of the Bechuanaland protectorate not annexed to Cape Colony in 1895. North of the Zambesi the country is not greatly developed, but to the south the company has introduced many improvements and largely reclaimed the country, which was an unexplored region up to within quite recent years. Within the company's domain have been built about 2500 miles of public road, nearly 2700 miles of telegraph lines, and many miles of telephone wire. Much of the country lies on a high plateau, and is suitable for agriculture and grazing, the climate being mild in the elevated portions. European and sub-tropical plants are said to thrive there, among those which it is claimed would repay expensive cultivation being tobacco, India-rubber, indigo, and cotton. There are extensive forests of hard timber, and foreign fruit and other trees have been imported. Sheep and goats have also been brought into the country. There are extensive gold reefs, and other minerals of importance are found. Coal, silver, copper, iron, tin, plumbago, and other ore deposits have been located, but gold is the only mineral which has been extensively worked. The latter metal has been mined mostly along the lines of ancient workings. These are said to be none other than the ancient mines of Ophir, from which King Solomon obtained supplies. The modern discovery of gold in Rhodesia is of very recent date. The first crushing was reported in September, 1898. By the end of August, 1899, the amount of gold obtained was 63,500 ounces, worth £224,951, obtained

from 115,924 tons of quartz. Rhodesia has a number of important railways. The Rhodesia or Bechuanaland road runs southward from Bulawayo to Kimberley, in Cape Colony, and thence to Cape Town, 1360 miles distant. This is a section of the projected "Cape to Cairo" railway. It was being connected in 1899 with Salisbury, 280 miles, while a northern extension to Gwelo was begun in May. A second road is the Mashonaland railway, which connects Salisbury with Beira, a port of Portuguese East Africa, 380 miles. The extension of this road from the coast reached Salisbury in May, 1899. This road is being widened to the general "Cape to Cairo" gauge. A railroad and telegraph line has been constructed between Salisbury and Umtali, and will run thence to the western shore and northwestern end of Lake Nyassa and to Lake Tanganyika. Bulawayo, in Matabeleland, is the principal commercial centre of Rhodesia. It is situated 4400 feet above the sea, and has an estimated white population of 7500. The population of the whole territory is unknown, but is placed at from 1,000,000 to 2,000,000. Of the whites said to be in Rhodesia, all but a few hundred live south of the Zambesi. The capital, Salisbury, in Mashonaland, has a given white population of 2000. All imports up to 1899 have come by way of the railroad from Cape Town, 1300 miles distant, but the Beira-Salisbury road will henceforth offer a comparatively short route to the seaboard. It was decided in 1898 to increase the capital stock of the South Africa Company from £3,500,000 to £5,000,000. The revenue of the company is derived mainly from mining, trading, and professional licenses, stand holdings, and postal and telegraph services.

The company administers Rhodesia, but the country north of the Zambesi is policed by imperial forces, and the eastern portion of British Central Africa is a definite imperial protectorate. In 1899 the administration of Northern Rhodesia by the company, under the African Order in Council, was placed under the provisions of the Northeastern Rhodesia and Northwestern Rhodesia Orders in Council. In Southern Rhodesia the company administers the country under the Southern Rhodesia Order in Council. In time Rhodesia will become a protectorate under direct imperial control.

History, 1899.—The principal matter of interest in 1899 was that of railway building. Mr. Rhodes visited Berlin during the year for the purpose of interviewing the German Emperor and his ministers on the right of way of the "Cape to Cairo" railway across German East Africa. No definite agreement was reached, but permission was given for the proposed continental telegraph line to cross German territory. (See EAST AFRICA, GERMAN.) Later in the year an agreement was made with the German government regarding the construction of railroads westward from Rhodesia to the coast of German Southwest Africa (*q. v.*). An effort was made to induce the British government to guarantee the interest on capital which it was proposed to raise for the extension of the Bechuanaland Railway north of Bulawayo. On the failure of these negotiations the British South Africa Company agreed to guarantee the capital of £3,000,000, which the railroad company decided to raise, and the statement was made that it will now be possible to complete the remaining 750 miles of railroad to the boundary of German East Africa, making a completed southern section of the "Cape to Cairo" road over 2100 miles long. The northern section already runs southward from the Mediterranean about 1100 miles, leaving to be constructed when the above extension is built about 2250 miles. Early in the war some fighting took place in Rhodesian territory, at Rhodes Drift, in which the British were forced back. The British troops were not pressed, and soon after moved south of the border line, where subsequent battles were confined. In 1899 the company for the first time imposed customs duties on certain articles of import, the estimated revenue from which for 1899 is estimated at £60,000. Trial by jury was instituted in Southern Rhodesia.

RICE CULTURE. See IRRIGATION.

RICHARDSON, JOHN PETER, ex-governor of South Carolina, died at Columbia, July 6, 1899. His family has been prominent in the State for several generations, and from it came four South Carolina governors. John Peter Richardson was the son of the governor of the same name, and was born in Clarendon County in 1831. After his graduation at South Carolina College he engaged in planting, entered politics, and was sent to the legislature. He left the legislature in 1862, and joined the Confederate Army, serving to the close of the war on the staff of General James Cantey. He subsequently re-entered politics, and in 1878 was elected to the legislature. He was elected State treasurer in 1880, 1882, and 1884, and in 1886 and 1888 was elected to the governor's chair. His duties, both as treasurer and as executive, were performed with faithfulness and ability. Governor Richardson was opposed to the Tillman movement of 1890, and upon its success was practically forced into retirement.

RISTIC, JOWAN, Servian statesman, died September 4, 1899. He was born at



CECIL J. RHODES.

Kragoujewatz in 1831; studied in Heidelberg, Berlin, and Paris, and in 1854 entered the service of the Servian state, and soon was given a position in the ministry of the interior. In 1858 he was made secretary of the embassy sent to Constantinople by Obrenovitch III., and he acted as the Servian envoy to the Porte in 1860, when he negotiated for the surrender of the Servian fortresses. In 1863 he became minister of foreign affairs, and two years later minister-president. During the minority of Prince Milan, from 1868 to 1872, Ristic was a member of the council of regency. He was superseded as president of the ministry by Marinowitch, but in May, 1876, after he had allied himself with the panslavic party, he was again called to that position, and also became minister of foreign affairs. In the strenuous days of the war with Turkey, and at the Berlin congress, in which he represented his native country, Ristic directed Servian politics with such skill that the state not only attained its independence, but increased its territorial extent. But when, encouraged by his success to plans of further conquest, he antagonized Austria, that government, by a threatening note, in October, 1880, forced his dismissal. Thereafter he was leader of the liberal party friendly to Russia, and from July, 1887, to the following January, he was again at the head of a liberal-radical ministry. He acted as first member of the regency from King Milan's abdication, in 1889, until the young King Alexander I. assumed control in 1893. Among the writings of Ristic is a work on the foreign relations of Servia from 1848 to 1858, entitled *Spoljasnji ornosaji Srbije*, and published in 1887; in German he wrote: *Kurze Charakteristik des geistigen und sittlichen Zustandes von Serbien*, 1851; *Die neuere Litteratur der Serben*, 1852.

ROADS. See PAVEMENTS AND ROADS.

ROBERTS, BRIGHAM HENRY, a Mormon, was in November, 1898, elected to the Fifty-sixth Congress from Utah. He was born at Warrington, Lancashire, England, March 13, 1857; came to the United States in 1866, and settled in Utah, where he received his education, being graduated from the normal department of Deseret (now Utah) University in 1878. He has three wives, taken before President Woodruff, of the Mormon Church, abolished polygamy in 1890. Mr. Roberts has been chiefly engaged in editorial work and other writing, but has travelled extensively in the United States and the British Isles. He was a member of the Utah constitutional convention in 1895, and in the same year was an unsuccessful candidate for Congress. At the roll-call of the Fifty-sixth Congress, on December 4, 1899, Mr. Roberts answered to his name, but opposition on account of his polygamous relations was made to his admission as a member of the House. A public petition that he be not allowed to take his seat had been made, signed, it was said, by 7,000,000 persons, and consisting of 28 rolls, each 2 feet in diameter. On the motion of Mr. Robert W. Taylor, of Ohio, that the question of admission be submitted to a special committee of 9, appointed by the speaker and empowered to take testimony, the speaker requested Mr. Roberts to step aside, which he did without, however, waiving his rights in the matter. The Taylor resolution came up for discussion the next day, and Mr. Roberts spoke strongly in his own behalf; the resolution was finally carried by a vote of 302 to 30. The final disposition of the case had not been reached at the close of the year. Mr. Roberts has written: *The Life of John Taylor*, the third president of the Mormon Church; *Outlines of Ecclesiastical History*; *The Gospel; A New Witness of God*. See MORMONISM.

ROBERTS, Lieutenant FREDERICK H.S., the only son and heir of General Lord Roberts, of Kandahar and Waterford, died in December, 1899, from wounds received in the engagement at the Tugela River, South Africa. The despatch to America, announcing the appointment of General Roberts to supreme command in South Africa, also brought the news of the death of his son. Lieutenant Roberts was born at Simla, India, in 1872. He was educated at Eton, and at the Royal Military College at Sandhurst. Though scarcely twenty-seven, he had seen service in four campaigns, and had won two mentions for gallant conduct on the battle-field. In the battle of Friday, December 15, in which he was mortally wounded, his gallantry led to his recommendation for the Victoria Cross.

ROBERTS of KANDAHAR AND WATERFORD, First Baron, Sir FREDERICK SLEIGH ROBERTS, commander-in-chief of the British forces in South Africa, was appointed to that position December 17, 1899, to supersede General Sir Redvers Henry Buller, whose forces two days before had suffered a serious reverse at Chieveley, on the Tugela River. General Roberts has had an active and most creditable career, and has won for himself a number of honorary titles, including Knight of the Order of St. Patrick, Knight of the Grand Cross of the Bath, Knight of the Grand Cross of the Star of India, Knight of the Grand Cross of the Indian Empire, and the Victoria Cross. In 1892 he was raised to the peerage. All of his promotions in the army have been "for merit." Excepting Lord Wolseley, the commander-in-chief, Lord Roberts is regarded as the foremost general in the British army. General

Lord Kitchener, the Sirdar of the Egyptian army, was appointed his chief of staff. At the time of his appointment General Roberts was commander-in-chief of the British forces in Ireland. He sailed for South Africa from Southampton, England, on December 23, 1899, and met General Kitchener at Gibraltar. General Roberts is the son of General Sir Abraham Roberts, and was born at Cawnpore, India, September 30, 1832. He was educated at Eton, Sandhurst, and Addiscombe, and when nineteen years old entered the army as a second lieutenant in the Bengal Artillery. His promotions have been as follows: Lieutenant, June, 1857; captain, November, 1860; brevet major, November, 1860; brevet lieutenant-colonel, August, 1868; brevet colonel, January, 1875; major-general, December, 1878; lieutenant-general, July, 1883; general, November, 1890; field-marshal, May, 1895. General Roberts served throughout the Indian Mutiny. He participated in the siege and capture of Delhi (being wounded July 14, 1857); the engagements at Bulandshahr Agra, Aligarh, Bantharra, and Kanaug; the expedition for the relief of Lucknow, and the siege of that city; the battles of Cawnpore and Khudaganj; the taking of Fategarh, Mianganj, Laloo, Umbeyla, and Malka. He was with the Abyssinian expedition of 1867-68, and the Lushai expedition of 1871-72, being present at the capture of the Kholel villages, and the attack along the Murtlang range. From November, 1873, to September, 1879, he commanded the Kuram Field Force; among his engagements at this time were Peiwar Kotal, and Sapari Pass. Relinquishing this command, he took command of the Kabul Field Force, retaining it until the following April; this expedition saw the battle of Charasia, the capture of Kabul, and the engagements before Sherpur. In these engagements in Afghanistan the British were successful, though, it is said, they were sometimes outnumbered six to one, and even twelve to one. In August, 1880, General Roberts led his force through a mountainous country, inhabited by hostile people, from Kabul to Kandahar, a distance of 300 miles, in twenty days, crushing Ayoob Khan at the end of the march. From 1881 to 1885 he was in command of the army at Madras, and from the latter year to 1895 commander-in-chief for India, being in 1886 in command of the army in Burmah. On October 1, 1895, he was appointed to the command of the forces in Ireland. General Roberts is honored not alone for his fighting record; he "fortified the frontier of Hindustan with a chain of fortresses from end to end; he made both the British and native troops far more effective than ever before; he obtained better rations for the men, and he secured better equipments." His services have been recognized not only by promotions and titles, but he has received many medals and clasps, and the formal thanks of the government of India and of both houses of Parliament. He has written *The Rise of Wellington*, 1895, and *Forty-one Years in India*, 1897.

ROBERTS, Sir WILLIAM, M.D., F.R.S., a London physician, was born at Anglesea, in March, 1830; died, April 16, 1899. Having taken his degree (B.A.) at University College, London, he began his medical practice in Manchester, 1854. He subsequently occupied the chair of medicine in Owens College, Victoria University, and in 1889 removed to London. He was knighted in 1885. Among his publications are: *On the Chemistry and Therapeutics of Gout and Uric-Acid Gravel*; *A Practical Treatise on Urinary and Renal Disorders*; collected articles on *Dietetics and Digestion*.

ROBINSON, Rev. CHARLES SEYMOUR, D.D., Presbyterian clergyman, died at his home in New York City, February 1, 1899. He was born at Bennington, Vt., March 31, 1829. At twenty years of age he was graduated from Williams College; he then taught school, but soon entered Union Theological Seminary, where he remained for a year, and then went to Princeton Seminary, completing his theological course there in 1855. From this time to 1860 he had a pastorate in Troy, N. Y. In the latter year he accepted a call to succeed Dr. Cox in the First Presbyterian Church, of Brooklyn, and remained there until 1868, when he took charge of the American Chapel in Paris. This was simply a preaching station, but under Dr. Robinson's influence it developed into a regular church organization. On account of the Franco-Prussian War he left Paris in 1870, and became pastor of the Madison Avenue Presbyterian Church in New York. In the summer of the following year he re-organized in Paris the work he had been forced to leave. From the Madison Avenue Church Dr. Robinson went to the Thirteenth Street Presbyterian Church, which charge he retained until 1887. After this time he did but little regular preaching or pastoral work. In all his charges, it is said, he showed great liberality, and when pastor of the Thirteenth Street Church he accepted no salary, on account of the financial weakness of the church. He is very widely known as a compiler of hymnals. His first hymn-book, *Songs for the Church*, appeared in 1862; following this were *Psalms and Hymns*, *Laudes Domini*, *Spiritual Songs*, and *Songs for the Sanctuary*. Of the last-named volume, it is said that more than 500,000 copies of



LORD ROBERTS.

the octavo edition were sold. Among his own writings are: *Church Work*; *Memorial Pulpit*; *Short Studies in the New Testament*; *The Pharaohs of the Exodus*, etc.

ROENTGEN RAYS. A writer in the *Medical and Surgical Review of Reviews* states that it has been computed that 1 person in every 800 is blind to the X-rays—that is, when looking through the fluoroscope is unable to see the objects clearly seen by the ordinary observer. During 1899 the field of the radiograph has been much enlarged. The X-ray is used in corroborating or correcting medical diagnosis with more frequency. The size and position of the heart can be more accurately learned from a radiograph than by percussion of the chest. Commencing consolidation from pulmonary tuberculosis is detected by an X-ray picture when detection is impossible by the physical signs. The presence of abnormal density of the lung in early or convalescing pneumonia can be determined readily by the radiograph, as well as in la grippe. Effusion in the pleural cavity, an emphysematous condition of the lung, hydrothorax, pneumothorax, thoracic aneurism, a new growth, were all easily detected and accurately bounded in skiagraphs. In many cases, the errors of percussion, as corrected by skiagraphs, were corroborated at post-mortem examinations. The X-rays have been used with success as a therapeutic agent in treating lupus by C. T. Holland, of London, as well as by Philip M. Jones, of San Francisco. Holland reported, in 1899, 3 cases so treated, with recovery in two cases and great improvement in the third. Jones reported two cases, one cured and the other improving rapidly under treatment. The method has been used in Germany with great success. See HEART, WOUNDS OF THE.

ROMAN CATHOLIC CHURCH. The only exception to the generally peaceful progress of the Roman Catholic Church in the United States during 1899 has been the trouble concerning the appointment of a German priest over a parish in East St. Louis. The parishioners rebelled against it, and were excommunicated, but by an order from Rome were received again into the church, and a priest of Irish extraction was appointed. Much indignation was caused among Catholics by the reported looting of the churches in Luzon. In 1899 there were in the Roman Catholic Church in the United States 11,119 priests, 11,571 churches, and 8,421,301 communicants. The latest report of the United States commissioner of education shows the Roman Catholics to have 60 institutions of higher education, with 608 professors, 5243 students, and endowment funds aggregating \$996,000. The Roman Catholic hierarchy in the United States consists of the apostolic delegation—Sebastian Martinelli, archbishop of Ephesus, Papal Delegate, Washington, D. C.; Rev. Donatus Sbordetti, auditor, Washington, D. C.; Rev. F. Z. Rooker, secretary, Washington, D. C., and 14 archbishops and 72 bishops. Four bishoprics were vacant in 1899. (For the College of Cardinals, see CARDINAL.) The total number of Roman Catholics in the world is estimated to be 240,000,000. It was announced that in Rome the year 1900 would be celebrated with great solemnity as a "Holy Year," or year of "Universal Jubilee."

ROOSEVELT, THEODORE, governor of New York, was born in New York, October 27, 1858, and graduated at Harvard in 1880. In 1882-84 he was a Republican member of the New York legislature, and in 1886 an unsuccessful candidate for mayor of New York. In 1889 President Harrison appointed him a national civil service commissioner. In 1895 he became a police commissioner of New York, and in 1897 assistant secretary of the United States Navy. He resigned the latter post to organize, with Colonel Leonard E. Wood, the First United States Cavalry Volunteer Regiment, called "Roosevelt's Rough Riders," consisting largely of recruits from the Western plains. He distinguished himself in the campaign before Santiago de Cuba, and was made colonel. In 1898 he was elected governor of New York. His books include: *The Naval War of 1812*, 1882; *Hunting Trips of a Ranchman*, 1885; *Life of Thomas H. Benton*, 1887; *Life of Governor Morris*, 1888; *Essays on Practical Politics*, 1888; *Ranch Life and the Hunting Trail*, 1888; *The Winning of the West*, 4 vols., 1889-96; *The Wilderness Hunter*, 1893; *American Ideals and Other Essays*, 1897; and *History of New York City*, 1891.

Governor Roosevelt, who was formerly colonel of the First Volunteer United States Cavalry, met his troopers at Las Vegas, N. M., on June 24, 1899, where they had gathered for their first annual reunion. Every troop in the organization was represented. Governor Roosevelt was elected honorary president of the regiment. Lieutenant-Colonel Brodie was president; Major W. H. H. Llewellyn, first vice-president; Lieutenant David Goodrich, second vice-president; and Lieutenant W. E. Dame, secretary and treasurer. On the following day Governor Roosevelt reviewed the regiment, and was presented with a gold medal by the people of New Mexico, who bestowed a sabre upon Lieutenant-Colonel Brodie. For some account of Governor Roosevelt's administration, see NEW YORK.

ROOT, ELIHU, a prominent New York lawyer, was chosen to succeed General

Russell A. Alger as secretary of war, and took the oath of office on August 1, 1899. Mr. Root is the son of Dr. Oren Root, for many years professor of mathematics in Hamilton College, and was born at Clinton, N. Y., February 15, 1845. After graduation at Hamilton in 1864 as valedictorian of his class, he taught for a year at the Rome (N. Y.) Academy, and then entered the University Law School in New York. Here he was admitted to the bar in 1867, and began practice. His first important case was the suit of the People *vs.* Ingersoll, "in which he successfully contended against Charles O'Connor's theory that the State, instead of the county, was the proper party to sue for money alleged to have been taken from the county." Mr. Root was counsel for the executors in the Hoyt and Havemeyer will cases, for the late Judge Henry Hilton in the Stewart will cases, and for the contestants in the Hammersley will case; he has had a considerable amount of experience as a corporation counsel. Beginning early in his career, he has taken an active part in politics, though he has made little effort to get office. He has been an opponent of undue machine power, and "early realized that pecuniary independence was necessary to personal independence in politics." In 1879 he was nominated as a Republican for judge of the Court of Common Pleas, but was defeated. He later became a leader in the Republican organization in his assembly district, and in 1886-87 was chairman of the Republican county committee. The only public office he ever held before becoming secretary of war was that of United States district-attorney for the southern district of New York, to which he was appointed by President Arthur in 1883. He served two years. In 1894 he was chairman of the judiciary committee of the State constitutional convention. He is a member of the New York Bar Association, has been president of the Republican Club, and in 1898 succeeded General Horace Porter as president of the Union League Club, to which position he was re-elected in the beginning of 1899.

Secretary Alger tendered his resignation on July 19, to take effect August 1. The President offered the portfolio to Mr. Root, who accepted on July 22. Notwithstanding the fact that Mr. Root is a civilian, that he was personally acquainted with very few army officers, that he had little knowledge of Washington official life or of military affairs in general, or of the functions and current work of the twelve bureaus of the War Department, yet so great was the public belief in his ability and integrity that the appointment met with general approval. The position was a difficult one to fill. Whatever may be said for General Alger's management of the War Department, the public, and in particular the friends of the administration, rejoiced to see him superseded by Mr. Root. The new secretary in a short time succeeded in making himself familiar with the workings of the department. He has managed the military affairs of the country in a highly creditable manner.

ROPES, JOHN CODMAN, author and lawyer, died October 28, 1899, at the age of sixty-three years. The definition of Mr. Ropes as "a precise writer and able historian" does not overestimate his abilities or fully sum up his services to students of warfare. His death deprived the world of letters of an eminent representative, but among students of the art of war his loss will be particularly felt. He left an unfinished work, *The Story of the Civil War*, the monumental character of which was shown by the first two volumes which had already appeared. It was announced some time after the writer's death that manuscript of the remaining two parts of the subject had been found to be in such shape as to promise the completion and publication of the entire series. The importance of this work lies in the fact that it gives to the public a most elaborate production concerning the military achievements of his own countrymen by a writer who had attained world-wide fame as the critic of a foreign war. In *The Campaign of Waterloo* he became an authority in England and France, and it has been said by conservative critics that as an expounder of the strategic problems of the period covered by this book, Mr. Ropes had few equals. Distinction in this country was first gained by his work among the archives of the Massachusetts Historical Society. Mr. Ropes was born in St. Petersburg, Russia, but of American parentage. He was graduated from Harvard in 1857 and from the Harvard Law School in 1861. Mr. Ropes achieved fame through a pursuit which he may originally have entered into as a side issue. He had taken up the profession of law after leaving the university and continued its practice up to the time of his death. He was granted an LL.D. from Harvard in 1897. Much of his life was passed in Boston, where he was a member of the American Historical and the Massachusetts Historical societies and of the Military Historical Society of Massachusetts. His more important books include *The Army Under Pope*; *The Story of the Civil War*; *The First Napoleon*; *The Campaign of Waterloo*; *Atlas of Waterloo*.

ROSE, SOCIETY OF THE. See **RUSKIN SOCIETY.**

ROSS, JONATHAN, LL.D., United States senator from Vermont, was appointed to

this position, as a Republican, by Governor Edward C. Smith, on January 11, 1899, to succeed Justin S. Morrill, who died on the 28th of the preceding month. Born at Waterford, Vt., April 30, 1826, he worked on a farm until he was twenty-one, teaching for a number of years in the winter time. He managed to prepare for college at St. Johnsbury Academy, and was graduated at Dartmouth in 1851; being admitted to the bar five years later, he practised his profession in St. Johnsbury until 1870. In 1862-63 he was State attorney for Caledonia County, from 1865 to 1867 a member of the legislature in the lower House, in 1869 a member of the last council of censors, and from 1866 to 1870 a member of the State Board of Education. In the latter year he was elected to the Supreme Court of Vermont, and in 1890 became chief justice. This position he held until he accepted the senatorship on January 11, when he tendered his resignation. His term will expire March 3, 1903.

ROUGH RIDERS' ASSOCIATION, formed in 1898 by the members of the First Regiment, United States Volunteer Cavalry. President, Lieutenant-Colonel Alexander O. Brodie; secretary-treasurer, Lieutenant J. D. Carter. See ROOSEVELT, THEODORE (second paragraph).

ROUMANIA, THE KINGDOM OF, a Balkan state, lying between Russia and Bulgaria, has an estimated area of 48,307 square miles and an estimated population in 1893 of 5,800,000. It includes the divisions Wallachia, Moldavia, and Dobruja. It formerly included only the first two, which were autonomous Turkish provinces. These were united in 1861. In 1877 they became independent, at which time there was added to them Dobruja, to the north, which was obtained from Russia as compensation for certain territory given up to her. In 1881 the country became a kingdom under the present ruler, Carol I. There is a senate of 120 members, elected for 8 years, and a chamber of deputies of 183 members, elected for 4 years. Dobruja does not have the right to elect senators and deputies, but in common with the other two divisions of the kingdom has a form of local government. The capital of Roumania is Bucharest, with a population recently estimated at about 250,000. The prevailing religion is Greek Orthodox, the number of adherents being estimated at from 4,500,000 to 5,000,000. Education is backward. Seventy per cent. of the population is engaged in agricultural pursuits. The soil is very rich, but in the summer there occur severe droughts, while the winters are equally extreme. The produce is mainly cereals, beans and peas, vines and fruits, and the country is rich in forests. The live-stock industry is important, and large numbers of cattle, sheep, and horses are raised. Salt and petroleum are the only minerals obtained, though others are said to exist. In 1897 the imports amounted to 355,782,000 lei (the leu being equivalent to 1 franc, or \$0.193), and the exports, 224,180,000 lei. The imports are chiefly European manufactures. In 1898 Roumania had 1800 miles of state railway, while communication is further afforded by the Danube River. An international commission exercises control of Danube navigation, with its seat at Galatz in Roumania, and collects the shipping and other dues. Roumania is represented in the superintendence of this branch of navigation, and in addition the state conducts a commercial navigation service on the Danube and Black Sea. Roumania has an army of about 46,000 on a peace footing, or 158,000 on a war footing, besides a militia. There is a navy of 12 vessels.

The parliamentary session opened November 13, 1898. In the course of the message from the crown mention was made of the King's visit to the Russian court in July, 1898, in the following language: "On the occasion of the visit which I paid to the Emperor of Russia his majesty gave me numerous proofs of a real friendship. The reception which was offered was as sympathetic as it was brilliant, and in the course of my travels in Russia I saw with especial satisfaction that the recollection of the brotherhood in arms, which was consecrated on the battle-fields of Bulgaria, remains intact." As to the programme of parliamentary work, the message stated that the main work of the session would be devoted especially to the formation of projects of law which had already been discussed in the previous session and to the consideration of the general budget. It was also said that since the treaties of commerce with foreign countries would expire soon, it was desirable to take the appropriate measures for establishing the economic affairs of the country on a sound basis. Another feature of the message was the announcement of a project of law dealing with professional education, which should provide the young with a practical training corresponding to the economic necessities of the country. The most important bills were passed by the parliament without difficulty. The law on the subject of professional education occasioned some sharp debates, but had no more serious consequence than the resignation of the minister of agriculture, commerce, and industry, who was opposed to the transfer of the professional schools to the jurisdiction of the minister of public instruction. However, an anonymous work appeared at Budapest, pretending to explain the accession of Stourdza to power as a result of an agreement with Baron Banffy, the former prime minister of Hungary.

This agreement was said to be injurious to the cause of the Roumanians who were under Magyar leadership. Although little faith was placed in the statements in this book by impartial persons, the publication gave a pretext to the opposition which started a campaign against Stourdza as a traitor to the Roumanians. In reality this campaign was merely a political move against the Liberal party. Interpellations followed, and the opposition spread to the streets, where it expressed itself in open-air meetings and processions. Finally a riot broke out in Bucharest on April 9, and on the following day Stourdza handed in his resignation, which was accepted. The prevailing opinion was that the government had been intimidated by the demonstration, but as a matter of fact the change of front was due probably to the weakness of the Liberal organization, which had undergone some serious defections. On the 23d, after long negotiations, a new ministry, in part Conservative, was organized under the presidency of M. Georges Cantacuzene, who had succeeded to the head of the party on the death of M. Catargi. The other members were as follows: Finance, General Mano; war, General Jacques Lahovary; justice, Dissesco; public instruction, Take Jonesco; domains, Fleva; foreign affairs, John Lahovary; public works, Istrati.

Early in the year 1899 a Socialist agitation arose in favor of a measure for land purchase on easy terms. Upon the defeat of this bill in the upper house the peasantry in the district between the Danube and the Olt rivers rose in revolt. On February 4 they defeated two regiments of infantry near Krayova, but quiet was finally restored.

ROWING. Boat-racing in oared-shells is rapidly becoming as popular in America as it has been for years in England, and the annual intercollegiate regattas are among the notable events of the athletic year. One of the features of 1899 has been the further development of college rowing, both as to the number of men actively interested and the quality of their form. At Harvard and Yale the inauguration of a system of club and interclub rowing, and class races, brought out a large number of crews, and greatly stimulated general interest and practice. The year saw also an increase in the number and character of contests, both preceding and including the annual regattas on the Hudson and the Thames. Races of the second-class were especially numerous for their kind. On May 30, at Cayuga Lake, the Cornell second Varsity defeated the Pennsylvania second Varsity in a two-mile eight-oared race, in 11:26½. This race is to be an annual spring contest. At Annapolis there occurred two-mile eight-oared races between the United States Naval Academy crew and the following university crews: Columbia, May 13, who won by 1½ lengths in 12:06; Pennsylvania, May 20, who won in 11:13 (and her freshman crew won a 1½-mile race in 7 minutes); and Yale, May 27, who won in 10:28. A noteworthy event among races of a third-class, representing interclub and class races, was the annual single-sculling contest for the Francis diamond medal at Cornell. This was won by Mr. Francis, who, in June, stroked the freshman boat at Poughkeepsie, and whose father, Charles S. Francis, of Troy, is the donor of the medal. The elder Francis, in the intercollegiate regatta at Saratoga Lake, in 1876, established the present intercollegiate two-miles single-sculling record of 13:42¾.

These races, together with the major intercollegiate regattas of the summer, made the season of 1899 the most active and successful in the history of college boating. On the Hudson, June 26-27, Pennsylvania won the Varsity Challenge Cup for the second time, in an eight-oared race of 4 miles. The times were: Pennsylvania, 20:04; Wisconsin, 20:05½; Cornell, 20:13; Columbia, 20:20. Four-oared Varsity race, 2 miles: Pennsylvania, 11:12; Cornell, second. Freshman eight-oared race, 2 miles: Cornell, 9:55; Columbia, 10:00; Pennsylvania, 10:10. The sensational contest between Wisconsin, who led almost to the finish-line, and Pennsylvania, and the bad defeat of Cornell, were features of the principal Varsity race. The introduction of a four-oared race into an intercollegiate regatta of this character was the revival of a custom which had not been observed for some years. This event was introduced also in the Harvard-Yale race. The stewards of the Intercollegiate Association decided toward the close of the year to increase still further the scope of the races by introducing in 1900 pair-oared and single-sculling contests, provided three entries in each could be secured by May 15, 1900. It was also decided to invite the participation of as many other colleges as might find it possible to equip crews. At the close of the year the colleges announcing their intention of entering one or more events were as follows: Columbia, Cornell, Georgetown, Pennsylvania, Syracuse, and Wisconsin, the latter with at least three crews. Georgetown and Syracuse are new entrants into college aquatics. The University of California signified its intention of sending a crew for the 1901 regatta. The 1900 regatta promises the nearest approach to an American Henley yet made. On the Thames, June 29, occurred the annual Harvard-Yale dual races. The feature of the 1899 regatta was the emphatic success of Harvard in the entire list of events. The official time of the Harvard-Yale races follows: Varsity eight-oared, 4 miles: Harvard, 20:52½; Yale, 21:13. Varsity four-oared, 2 miles: Harvard, 10:51; Yale, second.

Freshman eight-oared, 2 miles: Harvard, 9:33½; Yale, second. The races for 1900 will include the same events as in 1899.

Amateur rowing outside the colleges, though not so widely advertised, and neither so expensive, nor on the whole so highly developed, has a large number of devotees, especially in the East, where there are many fine boat-houses. Among the various regattas in that section there were held in 1899 the following: Harlem Regatta, Schuylkill Navy, Passaic River Association, Long Island Association, Hoboken Association, New England Association, Middle States Association, Metropolitan Association, People's Regatta, and National Association of Amateur Oarsmen. The last named held its twenty-seventh annual regatta at Boston, July 28 and 29, over a 1½-mile course.

In England, the Oxford-Cambridge race, March 25, over the regular 4¼-mile course, was won by Cambridge for the first time in ten years. The winner's time was 21:04, the race being won by 3 to 4 lengths. At the Henley Regatta, in July, B. Hunting Howell, an American student at Cambridge, won, for the second time, the Diamond Sculls, which in 1897 had been captured by Ten Eyck, of the United States. Howell's time was 8:06, and one of his opponents was Bright, of Toronto.

ROYAL ACADEMY, LONDON (Burlington House, Piccadilly), founded by George III., in 1768, for the maintenance of a free school of art, and the holding of annual exhibitions. In 1899 there were 40 royal academicians and 27 associates. The academicians and dates of their election were: Edwin Austin Abbey, 1898; George Aitchison, 1898; Sir Lawrence Alma-Tadema, 1879; Henry Haugh Armistead, 1879; George Henry Boughton, 1896; Thomas Brock, 1891; Thomas Sidney Cooper, 1867; Ernest Crofts, 1896; Henry William Banks Davis, 1877; Francis Bernard Dicksee, 1891; Luke Fildes, 1887; Edward Onslow Ford, 1895; Alfred Gilbert, 1893; Frederick Goodall, 1863; Andrew Carrick Gow, 1891; Peter Graham, 1881; Edward John Gregory, 1898; Hubert Herkomer, 1890; James Clarke Hook, 1860; Thomas Graham Jackson, 1896; Benjamin Williams Leader, 1898; George Dunlop Leslie, 1876; John Seymour Lucas, 1898; John MacWhirter, 1893; William Quilter Orchardson, 1877; Walter William Oules, 1881; Sir Edward John Poynter, 1876; Valentine C. Prinsep, 1894; Sir William Blake Richmond, K.C.B., 1895; Briton Rivière, 1881; James Sant, 1869; John Singer Sargent, 1897; Richard Norman Shaw, 1877; Marcus Stone, 1887; William H. Thornycroft, 1888; Alfred Waterhouse, 1885; John William Waterhouse, 1895; Henry Tanworth Wells, 1870; Henry Woods, 1893; William Frederick Yeames, 1878. President, Sir E. J. Poynter; secretary, Frederick A. Eaton.

ROYAL ACADEMY OF SCIENCES, BERLIN (AKADEMIE DER WISSENSCHAFTEN), founded in 1700, has 54 regular and 20 honorary and corresponding members. It publishes the *Monatsberichte*, and the two series of classical works, the *Corpus Inscriptionum Græcarum*, and the *Corpus Inscriptionum Latinarum*. Offices, Universitätsstrasse 8, Berlin.

ROYAL ARCH MASONS, the seventh degree in Masonry, reported for 1899 44 grand chapters, each representing a State or Territory (except Pennsylvania and Virginia), and 2235 subordinate chapters, with a total membership of 177,628. There are, besides, 18 subordinate chapters in the Territories of the United States, the Sandwich Islands, Chile, and the Chinese Empire, which are under the immediate jurisdiction of the General Grand Chapter. General grand high priest, Reuben C. Lemmon, Toledo, O.; general grand secretary, Christopher G. Fox, Buffalo, N. Y.

ROYAL ASIATIC SOCIETY OF GREAT BRITAIN AND IRELAND, founded in 1823 for the study of Asiatic arts, sciences, and literature, had in 1896 a membership of 523. There are branch societies in Bombay, Madras, Ceylon, the Straits Settlements, Japan, and China. The society has a library of 12,000 volumes, and publishes the *Journal*. President, Lord Reay, G.C.S.I.; secretary, Miss C. Hughes.

ROYAL ASTRONOMICAL SOCIETY (Burlington House, W., London), founded in 1820, has 680 members, publishes *Monthly Notices* and *Memoirs*. President, G. H. Darwin; foreign secretary, Sir William Huggins, K.C.B.

ROYAL SOCIETY, the well-known British scientific association, was organized in 1660, and incorporated by Charles II. in 1662. It has a library of 50,000 volumes, and headquarters in Burlington House, Piccadilly, London. Among the fellows (F.R.S.) elected in 1899 are: Professor Alfred C. Haddon, Professor C. Lloyd Morgan, F.G.S., and Lord Curzon, of Kedleston. President, Lord Lister; secretary, Sir Michael Foster, K.C.B., M.D. See ZOOLOGICAL SOCIETIES.

RUMSEY, ALMARIC, professor of Indian jurisprudence at King's College, London, died April 8, 1899. He was born in London, December 31, 1825; was educated at Rugby and Oxford. In 1857 he was admitted to the bar, Lincoln's Inn, and later practised in Indian Appeals at the Privy Council. He was a magazine contributor,

and from 1863 to the time of his death was on the staff of the *Athenæum*. Among his publications are: *A Chart of Moohummudan Inheritance*, 1866; *A Chart of Hindu Inheritance*, 1868; *The Moohummudan Law of Inheritance, and Rights and Relations Affecting It*, 1880.

RUSKIN SOCIETY OF LONDON (Society of the Rose), organized in 1881 for the purpose of studying the works of John Ruskin. Secretary, J. P. Smart, Jr., 5 Mount View Road, Crouch Hill, London, N., England.

RUSPOLI, Prince di, a former mayor of Rome and senator in the Italian parliament, died November 29, 1899. He was born in 1838, of the third branch of the family which bears the title of Princes of Poggio-Suasa. He fought for the unification of Italy, and returned to Rome in 1871 with the rank of captain. He was elected an alderman of Rome, a senator for seven consecutive terms, and mayor of Rome. His wife was the daughter of J. D. B. Curtis, of Boston, Mass.

RUSSELL, WILLIAM AUGUSTUS, ex-congressman from Massachusetts, died in Boston, January 10, 1899. He was born at Wells River, Vt., April 22, 1831; was educated at the academy in Franklin, N. H., and at a private school in Lowell. In 1853 he formed with his father a partnership in paper manufacturing at Lawrence, Mass.; his paper interests greatly developed, and mills were established in other towns, the principal ones being at Lawrence and at Bellow's Falls, Vt. In 1869 he instituted a new department of industry in this country by establishing a wood pulp mill at Franklin, N. H. Mr. Russell was elected as a Republican to the Massachusetts legislature in 1868, and in the same year served as a delegate to the National Republican Convention in Cincinnati. He represented the seventh Massachusetts district in the Forty-sixth, Forty-seventh, and Forty-eighth Congresses.

RUSSIA (EMPIRE OF ALL THE RUSSIAS) comprises northern Europe and all of northern Asia, has a total area of 8,660,394 square miles, of which 2,095,616 square miles are in Europe. The total population of European Russia in 1897 was 106,191,795, with a density of 51 per square mile, and that of the Asiatic dominions was 22,697,469, being only 4 to the square mile. The grand total of population of the whole Russian Empire is placed at 128,932,173, which gives 15 to the square mile. The chief cities in European Russia are St. Petersburg, with a population (1897) of 1,267,023; Moscow, 988,614; Warsaw, 638,209; Odessa, 405,041; Lodz, 315,209; Riga, 282,943, and Kieff, with 247,432. There are 9 other cities with a population of over 100,000, 30 others with over 50,000, and 27 others with over 30,000 population. In Asiatic Russia Tiflis, in the Caucasus, has 160,645; Tashkent, in Turkestan, has 156,414; Baku, in the Caucasus, 112,253, and there are 20 cities with a population between 30,000 and 100,000.

Emigration.—In the fiscal year, ending June 30, 1899, the number of persons emigrating from Russia and Finland to the United States was 60,982, which shows an increase of 31,154 over the preceding year. The increase of Russian emigration to the United States for this year was greater than any other increase reported, the next largest being that of Austria-Hungary. The number of Russians coming to this country was 1747, of Finns 6079, and of Hebrews, from the Russian Empire, 24,275. The opening of the Trans-Siberian Railway as far as Irkutsk in 1899 continued to give some impetus to the migration from Russia to Siberia. In the 17 years, ending January 1, 1899, the persons migrating to Siberia from European Russia numbered 1,117,715. In 1898 the number reached nearly 200,000.

A report of United States Commercial Agent Richard T. Greener, dated Vladivostok, November 19, 1899, shows that the Russian migration to the Amur and Khabarovsk regions of eastern Siberia has been considerable, but that numbers of migrants fail to reach these sections for various reasons, chief of which are the prospects of receiving better pay as laborers on the Trans-Siberian Railway, and the unfavorable reports concerning eastern Siberia, circulated by persons returning to Russia. The Khrestianin settlements in the Amur territory numbered, in 1897, families, 6593, with 44,943 persons. There were 79 grain elevators. The Amur territory is considered to be in all respects desirable for agriculturists, except for the ravages of the cattle pestilence. Settlers of the lowest peasant class receive pecuniary aid from the government.

Government.—An absolute hereditary monarchy, the entire executive, legislative, and judicial function being lodged in the Emperor. He is limited in his rulings only by certain precedents, such as the decree of Emperor Paul in 1796, concerning the succession to the throne, and that of Peter I., requiring the Emperor, his consort and princes of the blood royal to be members of the Greek Orthodox Church. The four imperial councils are the *Council of the State*, which has superintendence of finance, legislation, and civil and church administration; the *Ruling Senate*, which has judicial and executive functions; the *Holy Synod*, which controls ecclesiastical matters; and the *Committee of Ministers*, consisting of 12 ministers, of the imperial house and domains, of foreign affairs, of war, of public instruction, etc.

European Russia is divided into 68 governments (including Poland and Finland), and Asiatic Russia has 5 general governments. Finland (*q. v.*) retained in 1899 some vestiges of the constitution of 1772, but these have been virtually rendered inoperative.

Religion and Education.—The Græco-Russian or Orthodox-Catholic Church is the national church. It is independent of, but has connections with, the patriarchates of Alexandria, Antioch, Constantinople, and Jerusalem. The latest estimates place the number of Orthodox Greek Catholics in Russia at 75,000,000. The number of persons of other creeds is estimated as follows: Roman Catholics, 8,300,000; Jews, 3,000,000; Protestants, 2,950,000; Mohammedans, 2,600,000; United Church and Armenians, 55,000, and Pagans, 26,000. The statistics of education in the Russian Empire are not complete. The *Statesman's Year Book* for 1899 gives the number of universities as 9, with 923 instructors and 16,326 students; other higher institutions, 44, with about 9000 students. These figures do not include Finland, which has 1 university, at Helsingfors, with 2062 students in 1897. The number of elementary schools in 1896 was 78,724, with 113,984 teachers and 2,948,274 male and 831,544 female pupils; total, 3,779,818. Of the 265,000 men, more or less, which annually enter the Russian army, about 70 per cent., according to the latest obtainable figures, are illiterate. See AGRICULTURE (paragraph Agricultural Teaching.)

Currency.—By the coinage law of July 7, 1899, the currency question in Russia was settled by the adoption of gold as standard of value, and the unit of currency a rouble containing 0.7742 grams of pure gold, worth 51.4566 cents in United States gold. Silver is to be used only in fractional currency; state credit notes are to be exchanged at par with gold; silver coins are not to be accepted as metallic bank reserve; and the coinage of silver is not to exceed 400,000,000 roubles. The total amount coined up to January 1, 1900, was 220,000,000 roubles, and there were but 165,000,000 roubles in circulation. In 1899 there were in circulation 662.3 million roubles in gold coin, 143.3 million roubles in silver coin, and 555 million roubles in notes. The state bank was able, in spite of the adoption of the gold standard, immediately to redeem all circulating notes, and, in December, 1899, the circulation of notes was 518 million roubles, and there were 112 millions in the state bank. The ratio of reserve to outstanding notes was 16.7 to 10.

Finances.—The following table shows the budget for the year 1900. The total national debt in 1898 was 6,341,880,893 paper roubles, showing a decrease of some 400 million roubles from that of the year 1897. The imperial budget for 1900:

	Roubles.
Ordinary receipts.....	1,593,745,680
Extraordinary receipts.....	3,000,000
Imperial revenues.....	160,641,423
Total.....	1,757,387,103
Ordinary expenditures.....	1,564,441,679
Extraordinary expenditures.....	192,945,424
Total.....	1,757,387,103
Ordinary expenditures:	
Interest on loans.....	274,726,164
Higher governmental.....	3,007,995
Holy Synod.....	23,559,685
Imperial house.....	12,899,514
Foreign affairs.....	5,267,735
War.....	324,343,686
Navy.....	86,628,015
Finances.....	288,489,304
Agriculture.....	40,997,092
Interior.....	85,938,484
Public instruction.....	33,180,829
Public works.....	322,287,968
Justice.....	46,515,736
Sources of Revenue:	
Direct taxes.....	120,365,517
Customs.....	84,802,850
Indirect taxes.....	641,142,309
Regalian rights.....	173,687,800
State domains.....	422,748,423
Redemption of servitude.....	77,717,000
Payment for imperial bonds.....	66,941,018

Army.—Military duty is obligatory for all males over 21 years with certain exceptions, which include clergymen, teachers, and physicians. In European Russia they are required to serve upon attaining majority 5 years nominally, actually about 4 years in the active army, then 13 years in the reserve, and 5 years in the Zapas, or second reserve. In Asiatic Russia and in Caucasia the terms of military service are 7 years active and 6 reserve, and 3 years active and 15 reserve, respectively. The peace footing of the army was estimated in 1899 at 36,000 officers and 860,000 men—total, 896,000. This is made up as follows: Infantry, 563,000 men; cavalry, 119,000 men; artillery, 115,000 men; engineers, 24,000 men; and administration, 39,000. The army on a war footing was estimated at about 3,500,000 men.

Navy.—The Russian navy, according to a United States Navy Department publication, dated 1899, was, as reported in July, 1898, made up of 12 battle-ships, and 6 building; 10 armored cruisers, and 1 building; 3 protected cruisers, and 3 building; 3 unprotected cruisers, 15 coast-defence ships, and 1 building; 17 torpedo vessels, 1 torpedo-boat destroyer, and 28 building; 114 torpedo boats and 5 ships for special purposes. There were laid down in 1899, 4 battle-ships, 1 protected cruiser, 4 torpedo-boat destroyers, 2 torpedo boats, and 1 coast-defence ship. There were under construction during the year 9 battle-ships, 13 cruisers, 42 torpedo-boat destroyers, 16 torpedo boats, a torpedo-supply vessel, and a mining transport. There were launched in 1899, 4 cruisers, 3 torpedo-boat destroyers, and 1 transport. Russia is now in line with other powers in the pursuit of a definite naval programme. It is said to be the intention of the Czar that for every new British war-ship a Russian one of equal power shall be laid down.

Railways.—On January 1, 1899, there were over 29,000 miles of railway in Europe and Asia, of which the state owned 17,743 and private companies, 9711; state railways of Finland, 1616. Of the total length, only 5385 miles were double-track lines. The railway mileage of Russia is much less in proportion to the area and population than that of other European nations.

On April 28, 1899, the representatives of the Russian and British governments signed an agreement with regard to the interests of the two nations in railways in China. Russia agreed to seek no railway concessions in the basin of the Yang-tse, and to make no interference in the promotion of British railway interests there. In return for this Great Britain agreed to make no effort to extend railways in any part north of the great wall of China, and not to oppose Russian railway interests there.

The Trans-Siberian Railway.—One of the most extraordinary railroads in the world is that constructed across Siberia by the Russian government. An account of the engineering feats accomplished in building this road is given in the article on Railways (*q. v.*). The railway extended in 1899 from Ufa, in the Ural Mountains, to Irkutsk, on Lake Baikal, and the proposed extension when completed will go from that point to Khabarovka, on the Amur River. From the last-named place a line of railway has already been built to Vladivostock, on the Japan Sea. An all-rail route will, on the completion of the portion indicated above, be available from St. Petersburg and other Russian cities to the Pacific Ocean. The total length of the trans-Siberian line is 4950 miles.

Other new railway projects are: (1) The trans-Caspian road, which will when completed join Russia with the western portion of the Chinese Empire, and (2) the line to connect the preceding line with the Indian Ocean. The former will reach that part of the Chinese Empire known as East Turkestan, which, though not a thickly populated country, has for Russia a great strategic importance. To quote from the summary of *Commerce and Finance* (April, 1899): "Stretching eastwardly from Andijan, West Turkestan, the terminus of the line now being completed, lies a comparatively level section, through which caravan routes have for centuries extended, connecting China with Europe across this arid district. Along this caravan route the Chinese Government now maintains a telegraph line from Peking to the very point at which the new Russian line will terminate, while railway lines are already projected westward from Peking over a considerable portion of that distance. While it is scarcely to be expected that the eastward extension of the trans-Caspian system will result in an all-rail line to the Pacific for many years, it will, at least, touch the caravan route through which the inhabitants of that sparsely populated region obtain their supplies, and suggests the possibility, if not the probability, of a Russo-Chinese intercontinental and international line paralleling the trans-Siberian at such distance to the south as to render it practically non-competitive, the difficulties of such an enormous undertaking being no greater now than those which confronted the Russians a decade ago, when they planned the trans-Siberian railroad."

The line connecting the trans-Caspian line with the Indian Ocean is to run from Ashkhabad, in the southwestern part of Turkestan, about 200 miles from the Caspian Sea, to a port on the Persian Gulf, Bender Abbas, the control of which was recently

secured by the Russian government. From Bender Abbas communication could be maintained by sea with the oriental trade centres, which would be a profitable outlet for Russian products. The construction of this line is opposed by some Russian publicists, who have pointed out that it would give great facilities for British trade in Central Asia. In 1899 the Russian government sent engineers to survey the country between Orenburg and Tashkent for the construction of a line of railway connecting these two places. It will cross the Kirghiz Steppe and will join the trans-Caspian railway between Samarkand and Andijan.

Russian Waterways.—The total length of rivers, lakes, and canals in Russia, exclusive of Finland, was in 1896, 68,459 miles. The navigable waterways are as follows: (1) Suitable for floating rafts, 15,977 miles; (2) navigable down-stream, 7475 miles; (3) navigable up and down-stream, 23,079 miles—total, 46,531 miles. Of this, only 14,030 miles are navigable for steamers. There are canal systems uniting the Baltic and Caspian basins, the Baltic and White Sea basins, and the Baltic and Black Sea basins. The number of river craft in 1896 was 2500 steamers, of 211,000 tons, and 17,000 other vessels, of 8,640,000 tons.

Industry and Commerce.—The agricultural products of the Russian Empire include corn, wheat, rye, millet, flax, hemp, beet sugar, tobacco, and cotton. Russia produces four-fifths of all the flax used in the world; hemp is produced in great quantities, and raw cotton is becoming a staple of much importance in Russian Turkestan, while silk is produced in trans-Caucasia and Turkestan. About one-third of European Russia is forest land, much of which is protected by imperial decree from being cut. The principal manufactures are articles of food, textiles, paper, iron and steel, machinery, chemicals, leather, china, glass.

The United States deputy Consul-General Heydecker in St. Petersburg reports that in 1899 there were 1,212,972 acres under cultivation in the beet-growing governments of European Russia, showing an increase of 129,972 acres over 1898. The following statistics are from the United States Consular Reports: The sugar produced in Russia during the year 1898-99 amounted to 1,800,000,000 pounds, of which the home consumption was 1,188,000,000 pounds; 108,000,000 pounds were for reserve, and the export amounted to 504,000,000 pounds.

American cotton is sold in Russia, but the greater part comes by way of England, the direct lines being with Philadelphia, New York, Savannah, and New Orleans. The average price of American cotton in Moscow from May to October, 1898, was \$4.43 per pood of 36 English pounds.

The imports from the United States to Russia were valued in 1899 at \$10,029,793. The exports from Russia to the United States in the fiscal year ending January 30, 1899, were: From the Baltic, \$2,830,223 in value; from the Black Sea, \$1,710,161 in value, making a total value of \$4,540,384.

Postal and Telegraph Systems.—In 1896 the internal postal service carried 302,500,308 letters and postal-cards, 16,858,164 letters with money, and 110,037,929 periodicals and packages. The number of miles of telegraph lines was in 1895 about 78,400, with 157,400 miles of wire and 4623 stations.

Change in Russian Calendar.—The government decided in 1899 to discard the Julian calendar, which has been a source of confusion, particularly in international communications, and to adopt the Gregorian calendar. This will mean the addition of thirteen days to the present Russian dates. An astronomical commission has in hand the details of the change, and it is expected that it will be completed in 1901.

History, 1899.—In spite of the Czar's recommendation for disarmament, the estimates for army and navy were increased in 1899. Russia's policy of extending her influence in the direction of countries that were hampered by war or in other respects was seen in the extension of Russian railway interests toward the Persian Gulf, the key to the Indian Ocean and the British sphere of influence in the Orient. Some account of the Russification of Finland will be found in the article Finland (*q. v.*). Commercial and industrial development was marked by the subsidizing of steamers sailing from the Black Sea to Great Britain and the Pacific Ocean, and in the latter case the payment by the Russian government of tolls incurred by vessels passing through the Suez Canal. The development of Siberia was carried out both by means of the great trans-Siberian railway, and was supplemented by the appointment in May, 1899, of a commission to consider the abolition of the system of transportation of criminals and political offenders to Siberia. It was stated that, as Siberia is receiving more and more honest immigrants, the sending of criminals there has become injurious, and that at the same time, owing to the improved condition of the country, the transportation to Siberia has lost something of its penal character. A municipal commission was formed to substitute punishment by courts for transportation, to abolish or limit administering transportation by peasant boards, to improve the condition of Siberian convicts, and, in short, to reorganize the system of transportation and penal establishments.

On July 10, 1899, the Czarevitch Grand Duke George, brother of the Czar, died

at Abbas Touman, in the Caucasus, and the Czar's second brother, Michael Alexandrovitch, became Czarevitch. In the spring the demonstration of students unfriendly toward the administration resulted in the arrest of a large number of students and the closing of almost all the colleges and universities in the empire; the students generally were, however, pardoned in July. Famine and failure of crops, followed by outbreak of scurvy and the bubonic plague, were in the governments of Kazan and Astrakhan, and the Caspian districts of the Caucasus.

A new port on the Arctic Ocean was opened in 1899 near the Catherine Harbor, the extreme northern point of Russia's possessions, and situated not far from the maritime industries of the Mourman coast. There is sufficient depth of water to admit the largest steam vessels. The Consular Report of October, 1899, thus describes the new port: "The city will be called 'Alexandrovsk,' in honor of the late Emperor, at whose request S. I. Witte, minister of Finance, visited the northern coast of Russia in 1894. The minister reported that the location of a city at a point where a good harbor could be found was necessary to the development of the Mourman region. Kola, the principal commercial town of that region, is on a narrow, shallow gulf, about 40 miles from the Mourman coast. It is inaccessible to ordinary vessels, and thus forces the trade of northern Russia to seek such Norwegian ports as Vardey, Hammerfest, etc. The Gulf Stream keeps it from freezing during the winter. In 1896 the Emperor ordered this harbor improved and a city laid out, which has been carried out under the supervision of the minister of finance and the governor of Archangel, at the small cost of \$250,000, inside of five years from the time the improvement was first suggested. Work was begun only three years ago. The new port of Alexandrovsk will soon become an important centre for the industries of northern Russia, as it is capable of enormous development."

For an account of the new Russian ice-breaking boat, which arrived at Cronstadt, March 5, 1899, see ARCTIC EXPLORATION.

RUSSIAN LITERATURE. All things considered, the past year must be accounted a good one in Russian literature, for the list includes a fair proportion of the best known writers, and a number of works of real merit; yet these are in some danger of being unjustly overshadowed by the magnitude of the two principal literary events: the publication of Tolstoy's *Resurrection*, and the celebration of the centenary of the birth of Pushkin, the national poet. In this connection it is interesting to note that a sumptuous memorial volume was prepared, in honor of Pushkin, to which all the important writers in Russia were asked to contribute. The request met with a cordial response, excepting in the case of Tolstoy, who made the characteristic answer that he never could bring himself to write to order.

History.—Among the recent historical works, the first place must be given to the elaborate work of N. K. Shilder, *The Emperor Alexander I.*, which has been brought to a conclusion with the fourth volume. This is something more than an ordinary history, being rather a psychological monograph, in which the author has concentrated his attention upon the personality of the Czar; and the resulting analysis is full of scientific as well as artistic merit. Among other things minutely investigated in this work is the curious legend connected with the death of Alexander. There was a rumor current among the common people that he did not die, but became a hermit; and they identified him with a Siberian hermit, called Feodor Kuzmich, who expired at Tomsk in 1864, at about the age of ninety. *Imperial Sports of the Czsars Mikhail Feodorovich and Alexei Mikhailovich in Russia* is the title of an historical sketch by N. Kutepov, which contains some interesting details of the life of the earlier Russian rulers; while M. Diakonov, best known as author of *The Dominion of the Muscovite Emperors*, finds this year an equally congenial theme in his comprehensive study entitled *Sketches of the History of the Village Population in the Muscovite Empire*. Among other monographs which deserve a passing word are *The Insurrection of Pugachev in Siberia*, by A. Dmitriev-Mamonov, a work based upon original documents and personal investigations, and *The Protopope Avvakum*, by A. Borozdin, which not only throws fresh light upon the great Russian sectary, who, after a long series of frauds, ended his life at the stake, but gives a vivid picture of intellectual life in Russia in the seventeenth century.

Literary Criticism.—Among the volumes bearing upon the history of literature, one of the most important is the work of a young scholar, N. Kotliarevski, the title of which may best be rendered, *Disgust with the World (Weltschmerz) at the End of the Past and Beginning of the Present Century*. Starting from Rousseau, Heine, and Schiller, the author studies at considerable length the growing pessimism of the French romanticists during the period of the empire, and then passes on to Byron, whom he considers the best exponent of this type of pessimism. In analyzing the literature of the present time, he defines it on the contrary as a renaissance of optimism. An important and voluminous work is a four-volume *History of Russian Literature*, by A. Pypin, the three volumes published covering the ground from the earliest times to Lomonosov inclusive; and of equal importance is the vast biblio-

graphical work of S. Vengerov, *Russian Books, with Biographical Data About the Authors and Translators*, which is still in course of publication. An interesting contribution to the history of the Russian theatre is a volume by Shliapkin, *Natalia Alexeyevna and the Theatre of Her Time*. The work is based upon a curious manuscript discovered by the author dating from some time before 1721, and throwing considerable light on the beginnings of the Russian theatre, as it furnishes pieces from the repertoire of the Czarevna Natalia Alexeyevna, of which up to this time only the names were known. A valuable storehouse of learning is embodied in the recently published edition of the works of N. S. Tikhonravov, in six volumes. In the first volume the essays on old Russian literature are included, among others, a well-known essay on "Apocryphal Books in Old Russia;" in the second and third volumes are the essays on the literature of the seventeenth, eighteenth, and nineteenth centuries, including estimates of Lomonosov, Fonvizin, and Novikov. Lastly, it should be mentioned that the poet and critic, Merezhkovski, has issued a new edition of his enjoyable book, entitled *Eternal Fellow-Travelers*, containing studies of Pushkin, Montaigne, and Ibsen.

Fiction.—In Russia the novel holds an exceptionally high place, since it offers a convenient medium through which many of the nation's best thinkers can develop problems of social, ethical, or political import, which if presented in a more direct form would incur the ban of Russian censorship. This season it is doubly important, since the list includes the first part of Tolstoy's new novel, which is not merely the Russian novel of the year, but has excited a widespread interest in Europe and America. The story of how *Resurrection* was written forms a curious chapter in literary history. Some years ago Tolstoy wrote a novelette of this title, in which he told the story of a man of wealth and position who, one day finding in court a woman whom he had many years before seduced and afterward abandoned, and learning that she is on trial under a criminal indictment, suddenly has the conviction borne in upon him that he himself is the real cause of the poor creature's degradation; so that in expiation of his sin he marries her and follows her into exile in Siberia. The story as then written had about the dimensions of *The Kreutzer Sonata*, and, like the latter volume, undertook to point out much which the author looks upon as immoral and unchristian in the ordinary fashion of regarding love. The manuscript was laid aside, and might never have seen the light again had it not been for the interest which Tolstoy took last year in the curious religious sect of the Dhokhoborts, whom the Russian government was trying to force to abandon their traditions and to conform with the laws of the empire. In order to aid in defraying the expenses of transplanting this sect to Canada, Tolstoy volunteered to donate a story, the proceeds of which should all go to this cause; and arrangements were accordingly made for the simultaneous publication of *Resurrection* in Russia, France, Germany, England, and the United States. Tolstoy's literary methods, however, are peculiar, and when he undertakes to revise his work, his revision is not only thorough but radical. This partly explains how it happened that in the course of revision *Resurrection* grew from a short story to a novel of no less extent than *Anna Karenina*, and of a literary importance perhaps even greater. The subject is no longer merely his hero's expiation which Tolstoy relates; it is his entire life, the life of a man whom exterior influences have turned aside from the path which nature intended him to pursue, and who from the day that he becomes aware of this has no peace until he recovers his lost way. There is no question that he has made of it a great novel, or more properly speaking, two great novels, since it has undergone one last alteration. The book should have been completed in October, 1899; nothing remained but to write a short epilogue, depicting the arrival of the two central characters in Siberia, redeemed through love and repentance. But in writing this epilogue, Tolstoy perceived that in the moral resurrection of his hero and heroine there would be material for a sequel, which will in all probability be neither shorter nor less important than the present volume.

But it would not be fair to let *Resurrection* quite cast in the shade a number of other excellent novels which are also the product of 1899. The well-known writer Boborykin, who is more French than Russian in his literary methods, has issued two volumes, a big novel, *Where Can We Go?* and a short story, *At Home*, which has attracted considerable attention, and has been compared to some of the writings of the Swedish novelist, August Strindberg, on account of its prevailing tone of mysogony. Another notable novel is Yasinski's new volume, *The Rebellion of the Cockroaches*, which displays with a vigorous touch some little-known sides of Russian life, and which draws a striking parallel between the lives of the Russian peasant and of the cockroach. It is noteworthy, both for the merciless realism and for the gloomy originality of the conception. Other volumes deserving enumeration are *The Gods Who Have Risen Again*, by Merezhkovski, which has run as a serial in the *Nachalo* (The Beginning); three recent novels, by Madame V. Mikulich, *The Cherry Tree*, *Flashes of Lightning*, and *Mimochka*; and the collected short stories of Maxim

Gorki, who has a rare talent for depicting the world of vagabonds and heterodox people.

RUTHERFORD, WILLIAM, M.D., F.R.S., professor of physiology in Edinburgh University, died February 21, 1899, in his sixty-first year. He was the author of *Outlines of Practical Histology*, and of many physiological papers that have appeared in scientific magazines. He occupied the chair of physiology at Edinburgh from 1874 to the time of his death.

RYE. The following table, published by the Department of Agriculture, division of statistics, shows the acreage, production, and value of rye in the United States in 1899:

States and Territories.	Acreage.	Average Yield Per Acre.	Production.	Average Farm Price Dec. 1.	Farm Value, Dec. 1.
	<i>Acres.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Cents.</i>	<i>Dollars.</i>
Maine.....	983	15	14,745	84	12,386
New Hampshire.....	924	15	13,860	81	11,227
Vermont.....	3,173	17	53,941	63	33,443
Massachusetts.....	8,351	16	133,296	79	105,304
Connecticut.....	14,248	18	256,464	64	164,137
New York.....	227,100	16	3,633,600	56	2,034,816
New Jersey.....	66,719	15	1,000,785	55	550,432
Pennsylvania.....	262,406	15	3,936,090	51	2,007,406
Maryland.....	25,284	14	353,276	57	201,367
Virginia.....	36,719	9	330,471	53	175,150
North Carolina.....	45,754	7	320,278	75	240,308
South Carolina.....	3,825	5	19,125	1.09	20,846
Georgia.....	15,805	6	94,830	1.12	106,210
Alabama.....	1,822	8	14,576	1.04	15,159
Texas.....	3,766	10	37,660	82	30,881
Arkansas.....	1,732	11	19,052	74	14,098
Tennessee.....	11,892	9	107,028	67	71,709
West Virginia.....	13,229	10	132,290	62	82,080
Kentucky.....	24,443	10	244,430	70	171,101
Ohio.....	39,130	16	625,280	55	344,256
Michigan.....	78,358	14	1,097,012	52	570,446
Indiana.....	85,741	13	464,633	48	223,024
Illinois.....	76,955	15	1,154,325	47	542,533
Wisconsin.....	204,875	15	3,073,125	48	1,475,100
Minnesota.....	61,804	18	1,112,472	42	467,228
Iowa.....	112,770	18	2,029,860	40	811,944
Missouri.....	9,903	13	127,439	50	63,720
Kansas.....	140,532	11	1,545,852	42	649,258
Nebraska.....	62,319	16	997,104	38	378,900
South Dakota.....	2,451	15	36,765	37	13,603
North Dakota.....	16,315	15	244,725	37	90,546
Colorado.....	2,374	14	33,236	48	15,953
Utah.....	3,452	17	58,684	48	28,168
Washington.....	2,246	16	35,936	60	21,562
Oregon.....	5,616	11	61,776	70	43,243
California.....	36,472	15	547,080	70	426,722
United States.....	1,659,308	14.4	23,961,741	51.0	12,214,118

RYLAND, Rev. ROBERT, D.D., one of the oldest clergymen and educators in the United States, died at Lexington, Ky., April 23, 1899. He was born in 1805. For twenty-eight years he was president of Richmond (Va.) College, during much of which time he was pastor of a colored Baptist church in Richmond. This was the largest African church in the world, having nearly 3000 members, nearly all of whom were Virginia slaves. During his later years Dr. Ryland devoted his time in the interest of various churches and educational institutions in Kentucky and Tennessee.

ST. ANDREW, BROTHERHOOD OF, a Protestant Episcopal religious society of men founded in Chicago in 1883, the object being to "spread Christ's Kingdom among men." Their organ is *Saint Andrew's Cross*, published in New York. The society had in 1899 a membership of 13,000 in 1220 chapters in various parts of the United States, and in Canada 180 chapters and 2000 members. Similar societies have been organized in the Scottish Episcopal Church, and in England and Australia. President, James L. Houghteling; secretary, John W. Wood, 281 Fourth Avenue, New York City.

ST. CHRISTOPHER, or ST. KITTS, with Nevis and Anguilla, constitutes a presidency of the British crown colony of the Leeward Islands (*q. v.*). The combined area is 150 square miles, and the total population (1891), 47,662. The figures for the separate islands are as follows: St. Kitts, 65 square miles, population, 30,876; Nevis, 50 square miles, population, 13,087; Anguilla, 35 square miles, population, 3699. The capital is Basseterre (population about 10,000); the chief town of Nevis is Charlestown (population, 838). The leading products of the two latter islands are

sugar and rum, and of Anguilla, garden stock and salt. The aggregate entrances and clearances in foreign shipping for St. Kitts and Nevis in 1897 amounted to 491,629 tons. The following statistics are for 1898: Imports, £122,968; exports, £138,222; revenue, £40,430; expenditure, £44,659. The public debt in 1899 was £74,450.

ST. LUCIA, the largest island of the British crown colony of the Windward Islands (*q. v.*), has an area of 233 square miles and a population (1898) of 47,976. The white inhabitants are chiefly French creoles, who are Roman Catholics. The capital is Port Castries (population, 8000), a naval station and coaling depot. The chief products are sugar, cacao, rum, logwood, spices, tobacco. The sugar export in 1898 amounted to 8,403,750 pounds. The central factory system of sugar-growing has been instituted in the island. In 1897 the aggregate entrances and clearances in the foreign trade were 1,780,560 tons. The following figures are for 1898: Imports, £271,995; exports, £166,508; revenue, £67,628; expenditure, £60,975; public debt, £189,580.

ST. PIERRE and MIQUELON, the largest of two groups of small islands near the coast of Newfoundland, belonging to France. The area of the St. Pierre group is 10 square miles, and the population 5700; of the Miquelon group, 83 square miles, with 550 inhabitants. The chief town is St. Pierre. The dependency is administered by a governor, a council general, and municipal councils. Advantages are offered for primary and secondary instruction. For 1898 the local budget was 500,710 francs (the franc being worth \$0.193), and the expenditure of France in the budget of 1899, 290,791 francs. The principal industry is cod-fishing, carried on chiefly in French vessels. Exports to France in 1897 amounted to 26,954,415 francs and the imports from France 7,527,491 francs. The foreign tonnage entering at St. Pierre in 1895 amounted to 47,868 tons, carried in 1544 vessels. The French and local tonnage entering aggregated 1986 vessels of 116,774 tons.

ST. VINCENT, an island of the British crown colony of the Windward Islands (*q. v.*), has an area of 132 square miles, and a population of about 42,000. The government is directed by an administrator and a legislative council. The capital is Kingstown, with a population of over 4500. Fisheries constitute one of the chief occupations of the inhabitants. The leading agricultural products include sugar, rum, molasses, arrowroot, cacao, coffee, spices. In 1897 the sugar export amounted to £25,592; arrowroot, £21,859. In 1899 a free grant of £25,000 was made St. Vincent, and under the Colonial Loans Act £50,000 were advanced to further industrial development. The following statistics are for 1897: Total exports, £68,935; total imports, £70,824; revenue, £25,396; expenditure, £26,520. The aggregate entrances and clearances in foreign shipping in 1897 amounted to 248,877 tons.

ST. VINCENT DE PAUL, SISTERS OF CHARITY OF (*Filles de la Charité*), founded in Paris, in 1633, by St. Vincent de Paul and Mile. Louise le Gras. The mother-general resides in Paris. The mother-house in the United States is at St. Joseph's Academy, Emmitsburg, Md. There were 1639 sisters of this order in the United States in 1899. The duties of the sisters are: Teaching in academies and parochial schools; caring for abandoned infants; the education and care of orphan children; training them to usefulness and independence when grown up; and the care of the insane, the sick, lepers, etc.

ST. VINCENT DE PAUL, SOCIETY OF, a benevolent Roman Catholic society for the relief of the poor in large cities, was organized in 1835, and incorporated in 1872. The latest report of the society shows annual receipts amounted to \$180,537, and expenditures, in relief of all kinds, \$184,341. There was an increase in number of conferences, and a slight decrease in membership. Number of members, 6361. The general headquarters are in Paris. The local bodies, called particular councils, are in all countries of the world. The headquarters of the superior council of New York are at 2 Lafayette Place, Borough of Manhattan.

SALISBURY, LADY GEORGINA, wife of the Marquis of Salisbury, prime minister of England, died in London, November 20, 1899. Lady Salisbury was the daughter of the late Sir Edward Hall Alderson, a baron of the exchequer, and a famous lawyer and judge. The marriage of the premier, then Lord Robert Cecil, to Miss Alderson took place in 1857. Lady Salisbury is said to have been well fitted as the wife of the man who finally became England's prime minister, and she is commonly believed to have played no small part in the political history of the latter half of this century, wielding an influence through her husband both in the councils of the Conservative party and of the nation. Lady Salisbury was a member of the Royal Order of Victoria and Albert, and Lady of the Imperial Order of the Crown of India. Lord and Lady Salisbury had eight children, of whom one daughter has died.

SALT. The production of salt in the United States in 1898 shows the remarkable output of 17,612,634 barrels, which was 1,600,000 greater than in 1897, and

2,000,000 more than in 1896. The increased output was accompanied by an increase in price. Among new developments which are to be noted are the opening up of several new mines in Louisiana, all of them in the Avery Island region. In one drill-hole, sunk in Jefferson Island, the drill encountered salt at the depth of 20 feet, and passed on through over 1800 feet of salt without reaching the bottom of the deposit. In point of thickness this exceeds the enormous Prussian salt beds. The salt exported from the United States in 1898 amounted to \$4751, and went to Central America, Mexico, the Hawaiian Islands, Japan, Asiatic Russia, and Canada. Salt valued at \$13,953 was imported from Canada and European countries. The Russian salt industry is rapidly assuming large proportions. There are important deposits of rock salt in the Crimea, and also in the Caucasus, as well as at several other localities; salt lakes also occur.

SALVADOR, the smallest republic of Central America, lies to the south and west of Honduras, and borders the Pacific Ocean. The capital is San Salvador.

Area and Population.—The country comprises 14 departments, the total estimated area of which is 7225 square miles, and the population, according to the last official estimate, 803,534. Salvador is far more densely inhabited than any other country of Central America. Only about 20,000 of the inhabitants are pure whites, the rest being Indians or mestizos. The population of the capital is about 25,000; the other important towns are: Santa Ana, population 15,000; Sonsonate and San Miguel, each 10,000; Ahuachapam and San Vicente, each 8000.

Government and Education.—By the constitution the executive authority is vested in a president, who is elected for a term of four years, and is assisted by a cabinet of four members, controlling the following departments: The interior and government; foreign affairs, worship, justice and instruction; finance, fomento and beneficence; and war and marine. The president is Señor Tomás Regalado, who, in November, 1898, led a successful insurrection, causing the dissolution of the newly formed Greater Republic of Central America, and made himself the chief executive. The legislative power devolves upon a congress of 70 representatives, elected by popular vote for terms of one year. Of the representatives 42 are proprietors. Besides local magistrates and inferior courts, there is a Supreme Court of Justice. There is a national militia of 18,000 men and a regular army reported to number about 4000. Salvador has practically no navy. Education is gratuitous and nominally compulsory. There are about 600 primary schools with about 30,000 pupils, 18 schools for more advanced work with an enrolment of about 1200, and a national university with nearly 200 students pursuing courses in science, engineering, laws, or medicine. Thirteen periodicals are published in Salvador.

Finance.—The largest items of revenue are import duties and imposts on brandy: the chief expenditures are for the departments of finance, war, interior, and public works. The estimated revenue and expenditure for 1896 were 10,174,000 pesos and 9,745,000 pesos respectively. In 1896 the foreign debt was \$1,236,980, and the internal debt about \$3,488,000. On October 1, 1899, the value of the silver peso in United States gold was \$0.436.

Industries and Commerce.—The industry first in importance is agriculture, mining ranking second. The chief products include coffee, tobacco, indigo, sugar, and balsam. The chief metals found are gold, silver, copper, mercury, and iron. Coffee is the leading export, with indigo and tobacco next in importance. The chief imports are cotton goods, alcoholic liquors, iron goods, flour, and silks. The foreign trade is carried on principally with the United States, Great Britain, Germany, and France. The imports in 1896 amounted to 3,347,718 pesos, and the exports to 7,485,384 pesos.

Communications.—The roads of Salvador are far superior to those of most of the Latin-American countries; there are in all over 2000 miles of good roadway. The port of Acajutla is connected by rail with Santa Ana, Santa Tecla, and Ateos; also Armenia is connected with Ceiba, and Santa Tecla with San Salvador. Other railways are under construction, one of which will extend from the port Union, in the extreme southeast, northwest to San Salvador, a distance of 124 miles. In 1896 there were 1724 miles of telegraph lines, with 121 offices.

History.—A revolutionary conspiracy in Salvador was discovered and frustrated in July, 1899, and on the 15th of the month the government declared martial law in the department of San Salvador pending an investigation. There was no disorder or interruption of business. Another revolutionary movement developed late in the fall, General Toledo attempting to invade the republic. Despatches bearing date of December 4 announced that the government forces had met the insurgents near the frontier and repelled them with loss. On October 11, 1899, the president formed a new cabinet with Señor Reuben Rivera as minister of the interior and foreign affairs.

SALVATION ARMY, organized in 1865 by the Rev. William Booth, for the purpose of spreading the gospel among the masses. The history of this movement in the United States during 1899 is marked by the incorporation of the Salvation Army

under the laws of the State of New York. This body maintains various forms of social relief, such as nightly accommodation for 16,000 persons, farm colonies, etc., and there are many benevolent forms of organization for the benefit of the members of the army. They have an annual income of about \$1,000,000, and claim from 35,000 to 50,000 conversions annually. The commander-in-chief of the Salvation Army is Rev. William Booth, with headquarters at 101 Queen Victoria Street, London, E. C.; for the United States the commander is Mr. Booth-Tucker, with headquarters at 120 West Fourteenth Street, New York City. There were in the United States in 1899, 2689 officers, 753 corps, and about 40,000 members; 21 slum posts, 14 rescue homes, 75 food and shelter depots which give 27,000 meals monthly, 5 working-women's hotels, 7 wood and coal yards, 5 farms, and 2 children's homes. In Great Britain there are 4306 officers and 1338 corps, and in Australia 1527 officers and 831 corps. The organization is found in almost all the countries of the world. See VOLUNTEERS OF AMERICA.

SAMOAN ISLANDS, or NAVIGATORS' ISLANDS, lie in the Pacific Ocean, about 2000 miles south and 300 miles west of the Hawaiian Islands, on the trade route between the Philippines and the proposed Nicaraguan Canal. There are about a dozen islands in the group, two of which are said to be uninhabited, but three only are important—namely, Savaii, Upolu, containing the town of Apia; and Tutuila, in which is the fine harbor of Pago-Pago. The total area is about 1700 square miles. The population, according to an estimate given in 1899, is 36,000, of which one-sixth is in Tutuila, which became United States territory in 1899. The number of whites in the islands is about 400, half of whom are British. There are about 120 Germans, 30 Americans, and 25 Frenchmen. Most of the islands are of volcanic origin. The soil is very fertile and the climate is moist. It is of interest to note the reported fact that there is no native fauna, excepting a species of bat. In recent years swine, cattle, and horses have been imported. The principal crops are cocoanuts, copra, cotton, sugar, and coffee.

Commerce and Communications.—In 1897, the latest year for which full statistics are obtainable, the imports were \$329,630, of which Germany contributed \$83,562; the United States, \$53,415; Great Britain, \$13,322; and New Zealand and New South Wales, \$157,695. The remainder came from various Pacific islands. It is said that a large percentage of goods, not so credited, are of American origin. For instance, most of the kerosene comes from Sydney, though it is practically all of American production. The astonishing statement is made by the United States consul-general at Apia that, owing to the high rates of transportation from San Francisco, it is cheaper to ship goods from the Atlantic seaboard to Sydney, and thus to Samoa, than to Samoa direct. The exports in 1897 were \$239,198, including principally cocoanuts, and copra, or dried cocoanut. The exports of the latter were over 10,690,000 pounds. Exports went mostly to Europe, Australia, and the United States. There was once a quite active copra trade with the United States, but high rates and the devastating wars in Samoa have lessened the industry. There is coming about a revival of interest in the production of tropical fruits, which are far more suitable for cultivation than rice, tea, sugar, and cotton, it is said, and a number of important cocoanut plantations have recently been laid out. Vanilla, bananas, and pineapples are also grown with success. Samoa is connected by regular steam lines with New Zealand, Sydney, in Australia, and San Francisco. By the Berlin treaty the standard of exchange was made United States coinage. Values are mostly reckoned by that standard, but the principal money in circulation consists of British coins.

HISTORY.

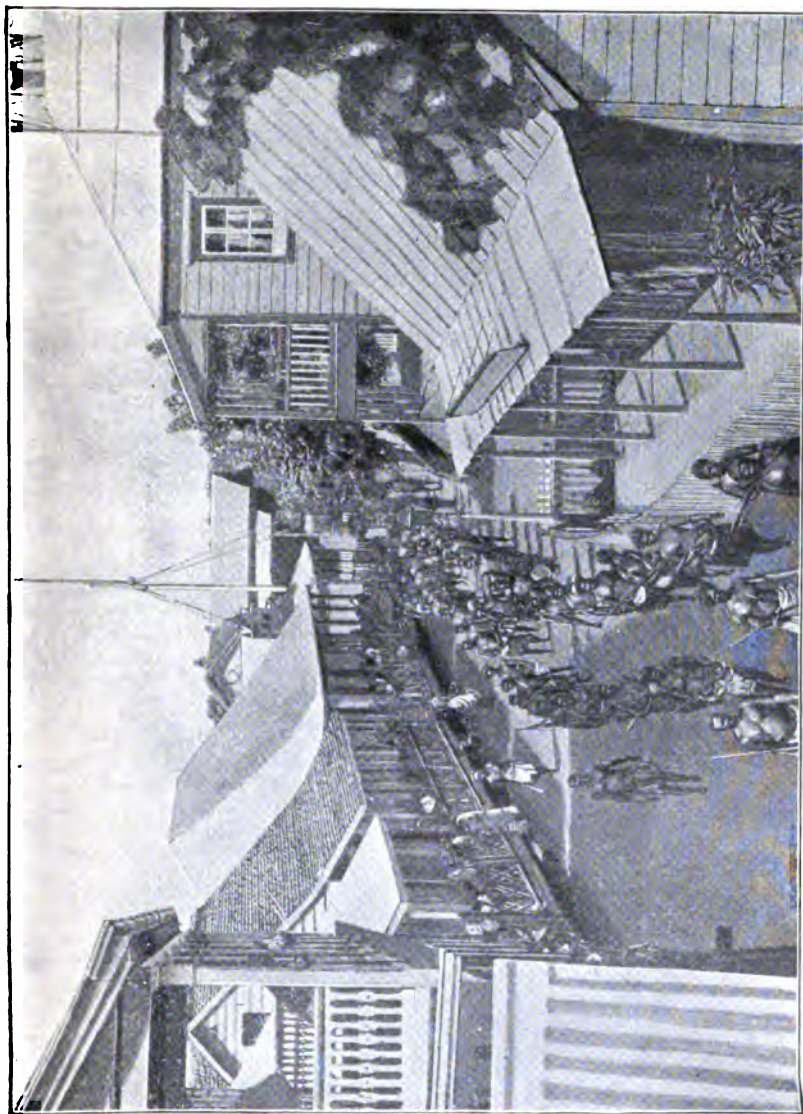
The history of Samoa in 1899 was very important. In order to explain the events of the year it is necessary to sketch briefly some phases of the recent history of the archipelago.

The Act of Berlin.—Down to the establishment of international control by the Act of Berlin in 1889, a sort of feudal system prevailed in the islands, the power being divided among native chiefs. For many years a sort of headship was exercised by a prominent family named Malietoa. There was naturally a temptation for Europeans to interfere in the interest of their respective governments, and there developed a spirit of rivalry among the Americans, English, and Germans. The treaty of 1878, granting to the United States the port of Pago-Pago on the island Tutuila, was followed by concessions to the German and the English governments. In 1881 Malietoa Laupepa was chosen king with the consent of the powers. A war followed between him and the rival candidate, Tamasese, and resulted in the overthrow of Malietoa, who was transported in a German war-vessel to the Cameroons. Tamasese now became king. But the election of a new king, Mataafa, in 1888, led to further troubles, and finally Prince Bismarck called a conference at Berlin to come to an agreement upon Samoan affairs. As a result of this conference the convention, known as the Act of Berlin, or Act of Samoa, was signed in June, 1890, and the

régime which it established lasted until the autumn of 1899. This placed the islands under the joint control of Great Britain, Germany, and the United States, but formally acknowledged the independence of the native state and the government of the king. It provided that the natives should choose their king and form of government according to their laws and customs, that Malietoa Laupepa should be restored to the throne, and that his successors should be chosen according to Samoan laws and customs. It established a Supreme Court whose chief justice was to be chosen by the three powers. His judgment was without appeal, but he could be dismissed at any time upon demand of any two of the powers. He had political as well as judicial powers, since his jurisdiction extended over disputes in connection with royal elections or questions of prerogative. Another feature of the new government was the establishment of the municipality of Apia, under a ministerial council of six members elected by the taxpayers, and a president designated by the three powers. The decisions of the council were subject to the approval of the three consuls, or, if they failed to agree, of the chief justice. It was also provided that the act should remain in force so long as it was not modified by the unanimous consent of the three powers.

The Question of Succession.—The jealousy of the powers, combined with the rivalry between the native claimants to the throne, led to much confusion. Malietoa Laupepa died in 1898, and according to the Act of Berlin his successor was to be chosen by the natives according to the laws and customs of the country. But it was hard to determine what were the laws and customs of a country like Samoa. Of the two candidates for the throne Malietoa Tanu was the favorite of the Anglo-Americans, and Mataafa was supported by the Germans. The Anglo-American party was successful, and Malietoa Tanu was chosen king. The Germans charged that Mataafa had been fraudulently excluded. The decision, however, rested with the chief justice, Mr. Chambers, an American, who pronounced in favor of Malietoa Tanu. There followed another petty war, resulting in the defeat of Malietoa, who took refuge on board an English vessel. Early in 1899 the consuls recognized that the Mataafa party, favored by the Germans, was *de facto* in possession, and established a provisional government with a German at its head, but soon afterward the Anglo-Americans opposed the action of this government in closing the Supreme Court of the Anglo-Americans. On March 11, 1899, Rear-Admiral Kautz, who had been sent to Samoa on board the *Philadelphia*, issued a proclamation, after an agreement with the consuls, dissolving the provisional government and ordering the partisans of Mataafa to withdraw. The German consul now issued a counter-proclamation declaring this manifesto null and void, and supporting Mataafa. Conflicts now broke out among the natives, and several officers and men of the British and American forces were killed. On April 1, an Anglo-American force fell into an ambush arranged by the partisans of Mataafa, and several of them were killed. There now followed a sharp discussion in the press of the three countries concerned. The English government criticised the action of the German representative, and, on April 14, Herr von Bülow made a speech in the *Reichstag* in which he declared his disapproval of the separate action of the Anglo-Americans, and their overthrow of the provisional government in March. At the same time Germany proposed the sending of a special commission to the island to settle the differences. This commission reported in favor of a government by a single power. In the meanwhile it proclaimed the abolition of royalty, and established a provisional government consisting of the three consuls. Subsequent events rendered their report superfluous, for on November 8, 1899, Germany and Great Britain reached an agreement providing for the partition of the islands.

The Partition.—The principal feature of the Anglo-German convention of November 8, 1899, was that the archipelago should be divided between the United States and Germany, England giving up her rights in return for compensations elsewhere. This was the substance of the arrangement: Germany received the two western groups of the Samoan islands—that is, Savaii and Upolu, with its capital at Apia, while the United States received the western group, Tutuila, with the important harbor of Pago-Pago. This settled the Samoan difficulty. By way of compensation England received from Germany the Tonga Islands, lying to the south of Samoa, including the Vavau and Savage Island groups, and also the islands of Choiseul and Isabelle in the Solomon group. Moreover, she gained certain advantages in Africa. In the interior of German Togoland and the English Gold Coast a new arrangement was made, whereby the neutral zone between the two colonies was divided anew, by far the greater part falling to England. Germany also gave up its extraterritorial rights to Zanzibar, which renunciation was to become effective when the other powers had renounced these rights. In South Africa, however, the German colonies gained some advantages from two conventions entered into, the one with the Trans-continental African Telegraph Company, and the other with the English Company of South Africa, whereby Germany obtained the guarantee that the net-



(Courtesy of *Ac. 12.1.10 of Archives*.)

SAMOAN REBELS MARCHING IN THE MAIN STREET OF APIA

work of railways and telegraph lines should be built in such a manner as to satisfy the interests of her two colonies of East Africa and Southwest Africa.

SAN DOMINGO, or the DOMINICAN REPUBLIC, comprises the eastern and larger, but less populous, portion of the island of Haiti, the western part being the Republic of Haiti. The capital is Santo Domingo.

Area, Population, Education.—The country comprises six provinces and five maritime districts, the total area of which is 18,045 square miles, and the population, according to the official estimate of 1888, 610,000; population of the capital (1892), 14,150, and of Puerto Plata, the principal port, 4500. The inhabitants are chiefly mulattoes, mestizos, and negroes, while whites are comparatively numerous. Spanish is the prevailing language. The state system of education comprises a professional institution, and normal, technical, secondary, and primary schools. The number of the primary schools in 1899 was estimated at 300, with an attendance of 10,000 pupils. Primary education is free and nominally compulsory. About forty newspapers are published in the republic. The state church is the Roman Catholic, but with certain restrictions, other denominational forms are allowed.

Government.—By the constitution of the republic the chief executive authority is vested in a president, chosen by an electoral college for a term of four years, and assisted by a cabinet directing the following departments: Foreign affairs and public works, interior and police, commerce and finance, war and marine, and justice and public instruction. The president is Señor Juan Isidro Jimenez, elected October 20, 1899. The legislative power devolves upon a congress of 22 deputies elected by direct vote. For the administration of the provinces and districts the president appoints governors, who in turn appoint prefects or magistrates for the government of the subdivisions, while in the communes there are municipal boards, chosen by the people. There are local justices, eleven courts of first instance, and a Supreme Court of Justice; the appointments to this court are only for the presidential term. There is a small regular army, a regiment of which is stationed in each of the provincial capitals. The navy amounts to very little, consisting of only three small gunboats.

Finance.—The chief items of revenue are import and export duties. In 1895 the revenue and expenditure in gold amounted to \$1,382,500 and \$1,351,250, respectively; the revenue for 1896 was \$1,545,450 and for 1897, \$1,601,204. A conversion of the foreign debt took place in 1897, according to which the debt was made to comprise two classes of bonds—one for \$13,317,025 gold, at 2½ per cent., and the other for \$7,299,000 gold, at 4 per cent. These bonds are secured chiefly by a lien on the customs duties, the collection of which is controlled by the Santo Domingo Improvement Company, of New York. In June, 1899, the congress enacted a law, to take effect July 1, requiring the payment of import duties to be in United States gold or its equivalent in currency, the American dollar (the official standard of value in San Domingo) being equal to six Dominican paper dollars. In December, 1899, the government was authorized by the congress to withdraw national coin in exchange for United States gold and silver, beginning in March, 1900. For a number of years Dominican finance has not been in a satisfactory condition; this fact was said to be one of the causes of the revolution of 1899.

Industries, Commerce, etc.—Agriculture and forestry are the principal industries; the former, however, is carried on for the most part in a crude and unintelligent manner, and in consequence Dominican products command only low prices in European markets. The cultivation of tobacco, though still the most valuable industry, is said to be declining, while the production of bananas, coffee, cacao, and sugar is on the increase. There are sugar factories in the south and west of the country. Among the minerals found are coal, salt, iron, gold, and copper, but there is practically no attempt at their exploitation.

High customs duties have hitherto retarded commerce. The leading exports are tobacco, coffee, cacao, cabinet woods, sugar, hides and goat-skins, and honey. The exports and imports in 1896 were valued, in United States gold, at \$2,710,362 and \$1,824,750, respectively. The most important exports were as follows: Tobacco, 6,332,148 pounds; sugar, 86,866,240 pounds; cacao, 4,308,820 pounds; coffee, 2,437,400 pounds; mahogany, 264,254 feet; cane honey, 1,777,120 gallons; divi-divi, 1,304,930 pounds. Of the import value, 45 per cent. came from the United States, 12 per cent. from the Danish West Indies, and 11 per cent. from British sources. The foreign trade for 1897 was reported to be about the same as that for 1896. Commercial conditions in 1899 were not prosperous, and the depreciated currency caused not a little distress; near the close of the year, however, it was reported that business was improving. Wagon roads, as in most Latin American countries, are few and in poor condition. The total length of railway open to traffic is 116 miles, but other lines are projected. The telegraph lines aggregate 430 miles.

Assassination of Heureaux.—The assassination of President Ulises Heureaux (q. v.) on the 26th of July, 1899, brought to an end the dominance of one of the most capable statesmen of Latin America and one of the most remarkable negroes

of our time. Though still a young man, he had been president of the republic since 1882; his last term was to expire in February, 1901. Heureaux was a man not only of resolute will, but of no mean intelligence, and he believed that his despotic and often ruthless methods were the best possible means of attaining adequate government for the heterogeneous and unstable population of San Domingo. Although his régime was marked by much high-handedness and many probably unjustifiable executions, and though his financial measures had burdened the country, still he gave to San Domingo a period that was "more free from revolution, more prosperous, better inclined toward outside capital and enterprise, and more disposed toward the ways of modern civilization" than it had enjoyed for very many years. The assassination was due partly to personal and partly to political causes. The assassin was General Ramon Caceres, who later became minister of war under Provisional President Horacio Vasquez, and whose father Heureaux was said to have put to death in 1884. Caceres shot and instantly killed the president as the latter was starting home from Moca, in the northern part of the island, where he had been to dispel some symptoms of discontent. Caceres was not apprehended, but two accomplices were arrested and shot on August 2. On August 1 it was announced that the vice-president, General Wenceslas Figuero, the constitutional successor to the presidency, had assumed the office of chief executive, and formed a cabinet.

The Jimenez Revolution.—In June, 1898, Juan Isidro Jimenez, whose father at one time had been President of San Domingo, started a conspiracy against the Heureaux government and attempted a filibustering expedition, which met with failure. Having landed at Monte Cristi, San Domingo, he received no assistance, but effected his escape, though many of his party lost their lives. He then went to Cuba, where he kept up his conspiracy, and in April, 1899, issued a bitter manifesto against President Heureaux. Almost immediately upon the killing of the president in July a strong insurgent movement in favor of Jimenez became evident; by the 7th of August five generals had declared for Jimenez, and by the 12th, 1200 insurgents had crossed the border from Haiti and defeated the government troops. Besides the personal ambition of Jimenez, the causes of the insurrection were said to be race feeling against negro domination—Heureaux being a negro—and dissatisfaction with the financial policies that had been in force. The northern part of the island was made the base of operations; various towns, including La Vega, Moca, and Macoris, surrendered without resistance, and though Santiago and a few other places were "taken by storm," there was little real fighting, the only serious conflicts being at Dejabon and Monte Cristi, where the insurgents were finally victorious. At the outbreak of the disturbances the United States government sent the cruiser *New Orleans* and the gunboat *Machias* to the port of Santo Domingo for the protection of American interests.

While the insurgents were gaining ground Jimenez attempted to direct the revolution from his position in Cuba; and then, having started for San Domingo, he was arrested about the middle of August by the United States authorities. In a few days, however, he was released by Governor-General Brooke, and on the 20th, without arms or recruits, sailed from Cienfuegos for San Domingo, which he reached at Puerto Plata on September 5, after stopping at Caimanera, Cuba. In the meantime, the revolution had been pushed almost to a successful conclusion. The insurgents were gaining steadily in strength and popularity, and on August 28 won a battle; on the 31st President Figueroa resigned, and a citizens' committee of safety undertook to preserve order in the capital. Probably more effective, however, than the committee was the presence of the United States war-ships in the harbor. Jimenez was greeted warmly at Puerto Plata, and later was received with enthusiasm in other cities. Pending a constitutional election, the successful revolutionists chose as provisional president General Horacio Vasquez, who made the revolution complete on September 5 by entering the capital and taking control of the government. Ramon Caceres was his minister of war. Arrangements were made for the election of delegates composing the electoral college, who nominate the president and vice-president, and though the date set was earlier than that which the constitution provides, no objections were made, and on October 20, 1899, Jimenez was regularly elected president. It was thought that the reforms he promised, if carried out, would greatly benefit the republic, but his position was difficult and the financial conditions serious. The public debt is large and the paper currency unstable and depreciated, the ratio sometimes falling as low as 50 to 1.

SANFORD, W. E., a Conservative senator in the Dominion Parliament, was drowned near Muskoka, Ontario, July 10, 1899. He was born in New York City in 1838; went to Hamilton, Ontario, when six years of age; after receiving a school education he returned to New York, where he entered the employ of a publishing house. He went again to Canada, began business for himself, founded with Senator MacInnes a great wholesale clothing house, and subsequently became interested in railroads and other financial enterprises. In 1887 he entered the Dominion senate.

Mr. Sanford was a liberal contributor to various charities; he founded the Sanford Mission among the Chinese on the Pacific coast and the convalescent hospital at Hamilton.

SANITATION. A vigorous appeal for an improvement in passenger-car sanitation was made by Dr. J. N. Hurty, of the Indiana State board of health, at the meeting of the Master Car and Locomotive Painters' Association, held in September, 1899. He attacked the prevailing mode of ornamenting passenger coaches with carvings, scrolls, panels, and work that catches and holds bacilli-laden dust, and enunciated, as the first principle toward securing better car sanitation, plainness of interior. Next he placed equable warming and good ventilation, and, third, freedom from smoke and dust. He also advocated substituting frequently changed linen covers for plush upholstery. Regarding spitting in cars, he claimed that from 2 per cent. to 5 per cent. of the samples of saliva voided in public places is found, on bacteriological examination, to contain disease germs, such as the germs of pneumonia, tuberculosis, catarrh, epidemic influenza, etc.

The urgent necessity of thorough disinfection in the sick room, whether the case in hand be one of contagious disease or not, has received attention frequently during 1899 by writers in many medical journals. Where there is a possibility of the spread of germs, cracks must be stopped, and ventilation into the house from the sick-room must be prevented. Isolation of a patient should be at the top of the house or in an extension, where ventilation by means of the outer air can be secured, and free access to sunlight can be arranged, rather than aerial disinfection attempted by means of chemicals burned or evaporated in the room. Excretions should be burned or thoroughly treated with germicides for at least two hours. Formaldehyde has been found efficacious as a disinfectant, because of its certain action, absence of unpleasant odor in dilution, absence of staining or injuring fabrics, and cheapness. See GARBAGE; SEWAGE PURIFICATION; WATER PURIFICATION.

Sanitary Legislation.—The most notable sanitary legislation of the year was that providing for State sewerage commissions in Connecticut and New Jersey. The Connecticut commission has little more than advisory powers, but its general purpose is to aid the municipalities of the State in settling troublesome questions relating to sewage disposal and purification. The New Jersey commission has statutory power to pass on all plans for new sewage disposal works, to collect information regarding the sewerage systems of the State, and to make a general study of sewage purification, employing such engineering and other assistance as may be necessary. Unfortunately, not a dollar was appropriated to meet the bills it might incur, or even to pay the salaries of its members. The governor allowed it a small sum out of the State contingency fund for office rent and sundry expenses.

SARCEY, FRANCISQUE, French dramatic critic, died May 15, 1899. He was born at Dourdan, October 8, 1828, and was educated at the Paris Normal School. For some years he taught school, but having trouble with the school authorities on account of some articles which he wrote for the press, he gave up his work, and went to Paris, where he contributed to the newspapers. He wrote for the *Figaro* and the *Revue Européenne*; in 1859 became the dramatic critic for the *Opinion Nationale*, and in 1867 for the *Temps*. From 1871 to 1884 he contributed largely to the *XIX. Siècle*. His writings became very popular, and in certain departments of dramatic criticism he was regarded as an authority. One of his most successful books was *Histoire du Siège de Paris*, 1871. Among his other works were: *Le Nouveau Seigneur du Village*, 1862; *Le Mot et la Chose*, 1862; *Etienne Moret*, 1875; *Le Piano de Jeanne*, 1876; *Comédiens et Comédiennes*, 1878-84; *Gare à Vos Yeux*, 1884; *Souvenirs de Jeunesse*, 1884; and *Souvenirs d'Age Mûr*, 1892.

SARTORI, LOUIS C., commodore, United States Navy, retired, died in Philadelphia, January 11, 1899. He was born in New Jersey in 1812, and at the age of seventeen was appointed to the navy. In 1831-33 he served on ships of the Brazilian station. He was commissioned lieutenant in September, 1841; served on the schooner *Stromboli* during the Mexican war and saw the capture of Tabasco. Early in April, 1861, he was promoted to the rank of commander, and during the war commanded successively the *Ohio*, at Boston; the *Florida*, North Atlantic Squadron; the *Portsmouth*, West Gulf Squadron; and the *Monongahela* and *Oneida* before Mobile. In September, 1866, he was made captain, and in December, 1873, being then in command of the navy yard at Mare Island, Cal., was raised to the rank of commodore. The following year he was retired.

SATURN, A NEW SATELLITE OF. See ASTRONOMICAL PROGRESS.

SAUNDERS, ALVIN, former governor of Nebraska, died November 1, 1899. He was appointed governor of the Territory of Nebraska by President Lincoln a few days after the latter's inauguration, and held that office until the admission of Nebraska to statehood in 1867. During this period Governor Saunders worked ac-

tively for the passage of the bill authorizing the construction of the Union Pacific Railroad. In 1867 he was elected a member of the United States Senate from Nebraska. Mr. Saunders's interests had not been confined to the State of Nebraska. In 1846 he was elected a member of the constitutional convention under which the State of Iowa was admitted into the Union. In 1854 he was elected to the Iowa senate and again in 1858. He was a delegate to the Republican national convention of 1860, and took an active part in the nomination of Abraham Lincoln. He also made a canvass of Iowa in Mr. Lincoln's interest. He was born on July 12, 1817, near Flemingsburg, Ky.

SAVAGE, THOMAS, lawyer, died at his home in Maplewood, Mass., January 31, 1899. He was born at Bradford, N. H., January 18, 1852; was graduated from Dartmouth College in 1874. President Grant appointed him United States district attorney for the southern district of Florida. Having resigned this position, he practised law in Boston, and became a member of the firm of Allen, Long, Hemenway, and Savage. He remained in the firm for several years; Mr. John D. Long, the present secretary of the navy, was one of the members. At the time of his death Mr. Savage was first lieutenant of the Ancient and Honorable Artillery Company, of Boston, and was prominent in several secret orders.

SAWYER, THOMAS JEFFERSON, D.D., LL.D., Universalist clergyman and teacher, died July 24, 1899. He was born at Reading, Vt., January 9, 1804; was graduated at Middlebury College in 1829, and from 1830 to 1845 was a Universalist pastor in New York City. During this time—from 1831 to 1845—he was editor of the *Christian Messenger*. In the latter year he became principal of the Liberal Institute at Clinton, N. Y., where he also taught classes in theology, remaining until 1852, when he resumed pastoral work in New York, continuing in this until 1861. In 1863-66 he was editor of the *Christian Ambassador*. When Tufts College was founded by the Universalists in 1855, Dr. Sawyer was offered its presidency, but he declined the honor; when, however, the Tufts Divinity School was opened in 1869 he became its head, and with it was thereafter connected, though during the last twelve years of his life he was unable to perform his work on account of old age and failure of eyesight. Besides declining to accept the presidency of Tufts, he refused to accept that of St. Lawrence University, Canton, N. Y., and of Lombard University, Galesburg, Ill. Dr. Sawyer has been accounted one of the greatest men in the Universalist Church. It fell upon him to gain a hearing for beliefs that at the time were regarded not only as revolutionary, but as infidel and abhorrent. "He was, literally, a pioneer, not only in proclaiming what was then a strange dogma, but in laying the foundation of an effective religious organization." And to his task he brought qualities of scholarship, culture, and controversial powers that were of a high degree. The Universalist Historical Society, which was founded at his suggestion in 1834, and of which he was secretary and librarian, collected largely through him a unique library of over three thousand volumes relating to Universalism; these books now form a part of the library at Tufts College. Among Dr. Sawyer's writings are: *Discussion of the Doctrine of Universal Salvation*; *Endless Punishment in the Very Words of its Advocates*; *Who is God—the Son or the Father?*

SCARLET FEVER. Search has been continued during 1899 with considerable zeal for the micro-organism which bacteriologists suppose causes scarlet fever, but it has evaded detection. Many have supposed that one of the pus bacilli, the streptococcus, which has been found in the throat and oftentimes in the blood of scarlet-fever patients, is the causative factor. But Frosch and Kolle positively affirm that the course of scarlet fever, as an infectious disease, cannot be brought into accord with the biology of streptococcus and the course of streptococcus infections. However, Dr. William J. Class, of Chicago, claimed in March to have discovered the diplococcus, which he considers the cause, during his investigations for the Board of Health of that city.

In April Dr. J. H. McCollom, of the isolation wards of the Boston City Hospital, published a study of 1000 cases of scarlet fever. He finds that Boston for seven years, 1892 to 1898 inclusive, "has had a higher death-rate from scarlet fever than Brooklyn, New York, Philadelphia, or St. Louis in every year save 1895, when New York's rate was slightly higher. In 1893 Boston also had more deaths per 10,000 of the living than Liverpool, Glasgow, London, Berlin, or Paris; in 1894 it was second to Liverpool, in 1895 it dropped below Berlin, Liverpool, and Glasgow, and in 1896 and 1897 was second only to Liverpool. This shows that scarlatina is unusually prevalent in Boston, as compared with most other places. The ratio of deaths is, however, less per 10,000 living than either diphtheria or typhoid fever. The diminution of scarlatina was greatest in 1898, dropping from nearly 3 in 10,000 living to .61. The morbidity per 10,000 has varied from 62.87 in 1892 to 16.77 in 1898. The added facilities for isolation afforded by the new isolation hospital have decreased in a marked degree both the number of cases reported and the death-rate. The per-

centage of mortality in the 1000 cases treated in the isolation wards, including moribund cases, was 9.8. A summary of these 98 fatal cases shows that scarlet fever uncomplicated caused 56 deaths; bronchopneumonia, 15; diphtheria and scarlet fever combined, 10; diphtheria alone, 9; pneumonia, 4; scarlet fever and erysipelas, 1; tubercular meningitis, 1, and 2 died from various complications."

Dr. MacCollom distinguishes "5 types of the disease. The first or malignant type causes the death of the patient in from 24 to 48 hours, and shows frequent hemorrhages from mucous surfaces, and in places a hemorrhagic eruption. The temperature is very high, the patient, as a rule, unconscious. The second type has a temperature of 102° to 103°, marked throat symptoms, and profuse nasal discharge containing streptococci; the patient is mildly delirious or semi-unconscious; eruption brilliant. The third type has a very high temperature and a brilliant rash; throat symptoms not prominent; no nasal discharge. In the fourth type the eruption is not brilliant and is most marked in the axillary and inguinal regions. Temperature, 99° to 100°. The fifth type has no eruption on the body, temperature little elevated; hands dry and hard; the only sign is the enlargement of the papillas at the tip and edges of the tongue."

Dr. Richard M. Pearce, of Boston, reports very thorough and careful consideration of the bacteriology and of the anatomy of scarlet fever, in the same volume with Dr. MacCollom's résumé. He concludes that as yet no light can be thrown on the causation of the disease; that the only constant gross change is a leyperplasia of the lymphoid tissue in every part of the body; that the anatomical points on which a clinical diagnosis is based are not usually seen after death. He finds the micro-organisms producing secondary inflammations to be streptococci, staphylococci, and pneumococci, in the order named, as regards frequency. See VITAL STATISTICS.

SCHOURER-KESTNER, AUGUSTE, a French chemist and politician, died September 19, 1899. He was prominent as one of the first advocates of the innocence of Captain Alfred Dreyfus, who had been condemned for treason. It was a curious coincidence that Scheurer-Kestner died on the same day that Dreyfus was pardoned. Scheurer-Kestner was born at Mülhausen, February 11, 1833. He studied in Paris, making a specialty of chemistry, and then undertook the management of a factory in Thann, owned by his father-in-law. He became possessed of republican ideas, and in 1865 founded a workingman's co-operative society; in this way he drew upon himself the displeasure of the government, which culminated in 1867, when he was sentenced to imprisonment for four months and was fined 2000 francs. He gained adherents, however, and soon became a man of considerable power in republican politics. In February, 1871, he was elected in Alsace to the National Assembly; here he protested against the peace with Germany. In 1875 he was elected to the senate for life. From 1879 to 1884 he directed the political columns of the Gambetta paper, *La République Française*. He became one of the secretaries of the senate, and later was elected its vice-president, but on account of his position in the Dreyfus affair failed of re-election to the vice-presidency on January 13, 1898. In October, 1897, Scheurer-Kestner publicly stated that he had proofs of the innocence of Dreyfus, and it was probably through him that the efforts of M. Zola were enlisted on the side of the condemned captain. He was president of the Chemical Society of Paris.

SCHÖNBORN, Count FRANZ, cardinal and lord-archbishop of Prague, died in Falkenau, June 25, 1899. He was born January 24, 1844, in Prague. He studied law, and after taking part in the war of 1866 devoted himself to theology, and in 1873 was consecrated to the priesthood. In 1883 he became bishop of Budweis, and in 1885 was raised to the archbishopric of his native city and to the cardinalate in 1889. Cardinal Schönborn was a zealous supporter of Czech interests.

SCHOOL. See HYGIENE.

SCHREINER, W. P., premier of the Cape Colony parliament, was born in Cape Colony and is the son of a German Lutheran clergyman and an English woman. He was educated at the South African College, Cape Town, and Downing College, Cambridge, taking honors at the latter institution in law studies in 1882. Having become a barrister in the Middle Temple, he returned to South Africa and began practice at the Cape. He soon gained a considerable reputation, and when, in 1893, Mr. Cecil Rhodes became premier of the Cape parliament for the second time, Mr. Schreiner was appointed attorney-general. It thus devolved upon him to advise the Cape government when President Kruger, of the Transvaal, in 1895 closed the drifts (fords of the rivers) to all colonial traffic. The opinion he then rendered was that this action of the Transvaal was in opposition to the terms of the London convention, and his view was supported by the Cape ministry and the home government. Strong pressure was thereupon brought to bear on the Transvaal government and war was nearly precipitated. But when in the early part of 1897 Mr. Schreiner appeared before the British South Africa Committee of the House of Commons as a witness in

the investigation that followed upon the Jameson raid, he said that though he still believed that the closing of the drifts was a violation of the London convention, he thought that arbitration would have been a better means of settling the difficulty. In 1896 he was appointed to negotiate with the Orange Free State concerning certain railway and customs duties that had arisen. In politics he is allied with the Africander Bond, and it was on his motion of want of confidence that the ministry of Sir Gordon Sprigg was overthrown, October 11, 1898. Later he became premier. He is a brother of Olive Schreiner (Mrs. Cronwright), the author. After the outbreak of the Boer war in the fall of 1899 Mr. Schreiner notified the Dutch inhabitants of Cape Colony that they would not be asked to bear arms against the allied Dutch republics, but at the same time warned them against lending aid to the enemies of Great Britain. See CAPE COLONY.

SOHRIVER, General EDMUND, died in Washington, D. C., February 10, 1899. He was a native of Pennsylvania; was graduated from the Military Academy at West Point in 1833; served in the Florida Seminole War, and in the Civil War was with the Army of the Potomac. He did good service in a number of battles, including Chancellorsville and Gettysburg, rising to the grade of colonel and brevet brigadier-general. He was retired in 1881.

SCHROEDER, FREDERICK A., who died December 1, 1899, was mayor of Brooklyn in 1876-78. Incidents of his administration were the stringing of the first wire of the New York and Brooklyn Bridge, the opening of the Ocean Parkway, and the beginning of the construction of Brooklyn's first elevated railroad. Mr. Schroeder was born in Prussia in 1833, and emigrated in 1848 to this country, where he engaged in the manufacture and, later, the importation of tobacco products. In 1871 he was elected comptroller of Brooklyn. In 1878 he was elected State senator. While at Albany he was instrumental in the enactment of a new charter for Brooklyn, increasing the mayor's powers and replacing single heads of departments for the old triple-headed commissions.

SCHURMAN, JACOB GOULD, A.M., Sc.D., LL.D., president of Cornell University, was appointed by President McKinley chairman of a commission of five members to investigate and report upon conditions in the Philippine islands; the appointment of this commission was announced on January 19, 1899. Mr. Schurman was born at Freetown, Prince Edward Island, May 22, 1854. At the age of thirteen he became a clerk in a general store at Summerside, Prince Edward Island, where he remained for two years, when he entered a village grammar school. In 1870 he won a scholarship at Prince of Wales College, Charlottetown, and three years later entered Acadia College, at Wolfville, Nova Scotia. At this institution in 1875 he won the Gilchrist scholarship in connection with the University of London, where in 1877 he received the degree of master of arts after a course that had been especially brilliant. In 1877-78 he studied in Paris and at the University of Edinburgh, where he took the degree of doctor of science and won the Hibbert travelling fellowship of \$1000 a year for two years. These two years he passed in study at the universities of Heidelberg, Berlin, and Göttingen, and in Italy. It was during this time that he met Mr. Andrew D. White, president of Cornell University, and then United States minister and now ambassador at Berlin; it was through his influence that Mr. Schurman subsequently became connected with the university. In 1880 he returned to Canada and accepted the chair of English literature, political economy, and psychology at Acadia, remaining there until 1882, when he was called to a professorship in Dalhousie College, and there taught English literature and metaphysics until 1886. In this year he became professor of Christian ethics and philosophy at Cornell, and later was made dean of the Sage School of Philosophy. In 1892 Professor Schurman was chosen president of the university, to succeed Dr. Charles Kendall Adams, resigned. He is the senior editor of the *Philosophical Review*. His publications include: *Kantian Ethics*; *Ethics of Evolution*; *The Ethical Imports of Darwinism*; *Belief in God*; *Agnosticism and Religion*.

The Philippine commissioners, excepting General Otis, sailed for Manila soon after their appointment, and of course the insurrection, which began on February 4, 1899, was in progress on their arrival. The commissioners besides President Schurman were Admiral Dewey, General E. S. Otis, Professor Dean C. Worcester, and Mr. Charles Denby. The commissioner's preliminary report was submitted to President McKinley on November 3, 1899; the document, on its publication, proved to be a fair and deeply impressive argument in favor of the retention of the Philippines.

SCIATICA. See LIQUID AIR.

SCIENCE, CHRISTIAN. See CHRISTIAN SCIENCE.

SCIENCES, IMPERIAL ACADEMY OF (Vienna), founded in 1846, consists of two sections, the philosophical-historical and the mathematical-scientific. Among its publications are *Denkschriften* and *Sitzungsbericht*. Each section of the

academy has 8 honorary foreign members and 30 foreign and 30 Austrian corresponding members. In 1899 there were 18 active members. President, Eduard Suess; general secretary, Professor Viktor von Lang.

SCIENCES, NATIONAL ACADEMY OF, incorporated by the United States Congress in 1863, had 86 members in 1889, and 22 foreign associates. The act of incorporation provided that the academy was to examine and make report upon any scientific matter for which it was to be paid by special appropriation. The annual stated meeting is held in Washington, D. C., beginning the third Tuesday in April. President, Wolcott Gibbs, Newport, R. I.; vice-president, Asaph Hall, Cambridge, Mass.; foreign secretary, Alexander Agassiz, Cambridge, Mass.; home secretary, Ira Remsen, Johns Hopkins University, Baltimore, Md.

SCIENTIFIC EXPEDITIONS. See ZOOLOGICAL STATIONS.

SCOTCH-IRISH SOCIETY OF AMERICA, organized in 1889 by persons of Scottish and Irish descent, of both sexes, for the preservation of the history of the Scotch-Irish race and the development of intelligent patriotism. There are a number of State societies. Honorary secretary, the Rev. J. S. MacIntosh, D.D., 220 Witherspoon Building, Philadelphia, Penn.

SCOTLAND, THE KINGDOM OF, forms the northern part of the island of Great Britain, and has an area of 29,785 square miles, and a population, according to the last British census, of 4,025,647. The largest city is Glasgow, population in 1898, 724,349. Other cities are Edinburgh, 295,628; Dundee, 164,575, and Aberdeen, 140,381. The total town population includes about two-fifths of the inhabitants of the kingdom. Among those engaged in occupations the industrial classes form the large proportion. Though Scotland is naturally a bleak country, the Scotch force of character has made it productive and wealthy. It is largely mountainous and its scenery is famous. Scotland, as a part of the United Kingdom, is represented in the British Parliament at London by 72 members. Of these 16 are Scottish peers in the House of Lords. Home government is provided for by a local government board, whose *ex officio* president is the Secretary for Scotland.

SCOTLAND, CHURCH OF (Established, or Anglican, though Presbyterian in polity), reported for 1899, 1700 ministers, and 648,476 communicants, with 16 synods and 84 presbyteries; has missions in India and Africa. The moderator for 1899 was the Rev. Dr. Pagan Bothwell. The lord high commissioner, representing the Queen, was the Earl of Leven and Melville.

SCOTLAND, FREE CHURCH OF, in 1899 had 16 synods, 75 presbyteries, 1144 ministers, and 404,828 communicants. It carries on missions in India, Africa, Syria, and Arabia. Moderator for 1899, Rev. James Stewart, M.D., D.D., Lovedale, South Africa.

SCOTT, NATHAN BAY, United States senator from West Virginia, was elected, as a Republican, by the legislature to succeed Senator Charles J. Faulkner, Democrat, January 25, 1899. Born in Ohio, December 18, 1842, Mr. Scott was educated in the public schools of Quaker City, Ohio, after which he was for a time clerk in a store. In 1862 he entered the Union army, serving until the end of the war, when he settled at Wheeling, W. Va., which has since been his home. He engaged in glass manufacturing. In 1880 he was president of the city council, and two years later began his service in the State senate, which continued until 1890. In 1886 he was a member of the Republican national committee, and from 1897 to 1899 was commissioner of internal revenue. On February 15, 1899, President McKinley nominated as his successor Mr. George W. Wilson, of Ohio. His term of office in the Senate will expire March 3, 1905.

SCULPTURE. The year 1899 adds little of value to the history of sculpture. The works that attracted most attention were portraits, either colossal or life-size statues and busts, such as Thornycroft's "Oliver Cromwell," E. Onslow Ford's "Queen Victoria," and Falguière's "Balzac," made in place of the unsatisfactory one that Rodin exhibited at the Salon of 1898.

Of the sculpture at the "Old Salon," Boucher's two marble groups, "Evening" and "Antique and Modern," received medals of honor, as did Ernest Dubois's "Pardon," and Émile Boisseau's "Diogenes." Falguière's "Balzac" attracted much attention, and was acceptable. Paul Dubois exhibited a wax group, called "Souvenir;" Antonin Mercié, a statue of "Vestrepain," destined for Toulouse; Frémiet, the colossal statue that the Suez Canal Company intends to place at the entrance to the canal in honor of F. de Lesseps; Gérôme, a statuette of "Frederick II.;" Gardet, a "Lion;" Raoul Larche, a marble group, entitled "Violets;" Henri Allouard, the "Lord's Prayer;" Mlle. Jeanne Itasse, a "Bacchante," and Aimé Octobre, a group called "Remorse." Barrias attracted great attention by his "Nature Revealing Herself," a polychrome marble statue for which the sculptor used Algerian onyxes, and spent many years in study to obtain his results. A noted critic says: "The pliability of

the veil, its coloring, the tone of the garment, which recalls the most marvellous Indian stuffs, and the naïve expression of the head, offer the spectacle of an incomparable purity of line and richness of color.

At the "New Salon," Rodin's bronze "Ève" and busts of "Falgüière" and "Rochefort" were especially admired. The sculpture at the Royal Academy was of a higher order than usual. Mr. Hamo Thornycroft's colossal "Oliver Cromwell," intended for Westminster Hall, won great praise for the sculptor. Hardly less noticeable were: E. Onslow Ford's surpassingly fine portrait of "Queen Victoria," and a dignified and satisfactory one of "Prince Leopold of Battenberg." His "Sir W. Agnew" was considered a fine example of carving. Other fine examples were C. J. Allen's groups, called "Rescued" and "Love and the Mermaid," in which the sea nymph clasps Cupid's feet with passion; H. C. Fehr's "James Watt," Mr. Longmaid's "Eve," J. W. Rollins's "Water Baby," Mr. J. Drury's "J. Priestley," a memorial of the great chemist for the city square at Leeds; A. C. Lucchesi's "The Myrtle's Altar," G. Simonds's "Song and Dance," a design for a fountain, where three wading birds dance to Ariel's music; C. Dressler's "The Four Winds," Miss L. G. Williams's bust of "A Peri" and "Sappho," Mrs. C. Barker's "Sleep," F. D. Wood's group of "Dante at Ravenna," W. R. Stevens's "Sir Lancelot and the Nestling," W. G. John's "The Elf," T. Brock's recumbent statue of the late "Archbishop of Canterbury," E. L. Dunkley's "Love's Sport," J. M. Swan's "Leopard Running," a statuette in bronze, and G. J. Frampton's "St. George," a gilt and enamelled figure in the style of Italian art in the sixteenth century. Sir Laurence Alma-Tadema presented the Musée des Académiciens, Antwerp, of which he is a member, with a bronze bust of himself, by E. Onslow Ford. The National Gallery acquired a bronze bust of "Prince Charles Edward Stuart," by Edward King, and a marble bust of "Lord Tennyson," by F. J. Williamson. A statue of "Sir John Millais," by J. Brock, was placed before the Tate Gallery, at Millbank; Gérôme's statue to the "Duc d'Aumale," a heroic group in bronze, was unveiled at Chantilly, October 15; Thornycroft's statue to "Oliver Cromwell," so conspicuous in the Academy, was unveiled at Westminster, October 31; a statue of "Velasquez," by Romanos, was unveiled in front of the Prado Museum, Madrid; and Dubois's monument was unveiled in honor of Bossuet, representing the "Aigle de Meaux," and a tablet to William Blake, by Nicholls, was erected at the Central Lambeth Library, Lambeth, of Irish marble, with a relief of bronze, representing Blake's own "Death's Door." Boyle's statue of "Benjamin Franklin" was placed before the post-office in Philadelphia, and Bissell's "President Arthur" in Madison Square, New York. Macmonnies gave a bronze group of a "Lioness and Cubs" for Prospect Park, Brooklyn.

The most significant event in sculpture in America was the erection of the temporary "Dewey Arch," at Madison Square (Fifth Avenue and Twenty-fourth Street, New York). The arch was modelled in plaster, and was 70 by 35 feet. With its quadriga it measured 95 feet in height. It was designed by Charles R. Lamb, of New York. The crowning figure, by J. Q. A. Ward, president of the National Sculpture Society, was a restoration of the "Victory of Samothrace," surrounded by nereids on sea-horses. Eight heroic figures (naval heroes) decorate the entablature. These were the work of Hartley, Lukeman, T. S. Clark, Boyle, George D. Brewster, Partridge, E. C. Potter, and H. K. Bush-Brown. Isidor Konti made the spandrel figures of the North and East Rivers. Four colossal groups against the piers formed the chief ornamentation: "The Call to Arms" was executed by P. Martiny; "The Combat," by Karl Bitter; "The Triumphant Return," by Charles C. Niehaus, and "Peace," by Daniel French. Three sculptors died during the arduous task of completing the work within the short limit of time—Giovanni Turini, Casper Buberl, and Henry Baerer.

Daniel French executed a Dewey medal, the obverse bearing the head of Admiral Dewey, and the reverse a gunner ready for action.

The National Sculpture Society gave to the Metropolitan Museum of Art some bronze reproductions of works by the late Olin L. Warner, and the Boston Museum acquired some of the Marlborough gems. The Peabody Institute of Baltimore offered for the second time its Rinehart scholarship in sculpture, which allows the successful competitor a studio in Rome for four years. Not much sculpture of importance was sold. The highest prices were reached at the sale of the Hoffman collection of antiques in Paris, when a terra-cotta head of Pan realized 3000 francs, a bronze statuette of Bacchus, excavated at Rome in 1880, 20,000 francs, and a fine head of Parian marble, supposed to be of the time of Praxiteles, 11,000 francs. An antique bust of "Alexander the Great," with head and neck of gilt bronze, was bought at the sale of the Bardini collection in London by D. Kelekian, of New York. "Trajan," one of the best portrait busts of Optimus Princeps, migrated from the Villa Barberini, Castel Gandolfo, and the bust of Bindo Altovito, by Benvenuto Cellini, chained to the wall in the reception-room of the Altoviti Palace by order of Pius VII., passed across the Alps, and, perhaps, across the ocean, to an unknown

purchaser. A fine head of the Venus type was exhibited at Sypher's, New York, said to have come from the island of Melos. It was the work of a Grecian or Græco-Roman sculptor. The Department of Greek and Roman Antiquities in the British Museum obtained the marble head of a warrior of considerable value. To the regret of all the world Michael Angelo's famous "Leda" in the Bargello was injured.

SCULPTURE SOCIETY, NATIONAL, founded in 1893, was in 1899 composed of 62 sculptor members, 2 honorary fellows, and 309 lay members. The society aims by exhibitions and committees of advice to promote the interests of sculptors and to give advice, whenever requested, in the matter of selecting designs for statuary. Annual exhibitions are held at 215 West Fifty-seventh Street, New York City. President, J. Q. A. Ward; secretary, Barr Ferree, 7 Warren Street, New York.

SEAL FISHERIES. See ZOOLOGICAL LITERATURE (paragraph Special Treatises).

SEALING. The danger of the complete extinction of the Alaskan seal herd, which was noted in 1898, was even more apparent in 1899. In 1899 only 16,812 skins were taken on the seal islands, although the quota allowed by law was 30,000, while in 1898 there were 18,047 young male seals killed on the islands. The diminution is attributed to the destruction of the females by pelagic sealing. In the report of the secretary of the treasurer, of December, 1899, it was stated that the rookeries showed a continued decline in the herd. Under the provisions of the act of March 3, 1899, the quota of seals allowed by law must not be killed in any other months than June, July, September, and October. In 1899 only one American vessel engaged in pelagic sealing.

SEARCH LIGHT. See FIRE PROTECTION.

SEGANTINI, GIOVANNI, an Italian painter, died September 29, 1899. Born in Arco on the 15th of January, 1858, he passed much of his youth in pastoral pursuits among the mountain villages. When his talent had brought to him some distinction, he came to Milan, where he resided most of his life. He lived, however, for a long time at Albula, in Switzerland, where he entered into the life of the peasantry, receiving an excellent preparation for painting his genre pictures. Among his principal works are those of Swiss life, and pictures of the house and street life of Milan. In 1892 he received the first medal at the Munich art exhibition. His pictures are highly prized in Germany.

SEMMES, THOMAS JENKINS, professor of civil law in the University of Louisiana, and one of the prominent lawyers of the South, died in New Orleans, La., June 23, 1899. He was born in Georgetown, D. C., in 1824; was graduated at Georgetown University, and at the Harvard Law School, where he was a classmate of President Hayes. He practised law in Washington until 1850, when he removed to New Orleans, where he was successful in both law and politics. He was elected to the legislature, was appointed by President Buchanan United States district attorney in 1860, and afterward served in the Confederate senate. His property was confiscated during the war and Semmes was obliged to start anew. He did not, however, re-enter politics. In 1886 he was elected to the presidency of the Bar Association of America. He was a cousin of Captain Raphael Semmes, of the Confederate cruiser *Alabama*.

SENEGAL, a French colony on the coast of West Africa, extends from a point somewhat north of Cape Verde to the British crown colony of Gambia. Its area, together with a definite portion of the settlement of Rivières du Sud, is over 14,700, and the population, 174,000, of whom 135,000 are in Senegal proper. Included in the colony are various protected states, thus extending its frontiers north to Cape Blanco and east and south to French Guinea and French Soudan. With these states the area is 115,800 square miles and the population, 2,000,000. The capital is St. Louis, population about 22,000; another important centre is Dakar, population, 2000. The colony is administered by a governor-general, assisted by a colonial council, and is represented in Paris by a deputy. Over 2500 troops, including natives, are stationed in the colony. The public debt of the colony in 1898 was 517,657 francs; for the same year the local budget amounted to 3,929,367 francs, and the expenditure of France (1899 budget) was 6,106,942 francs.

The leading exports include gums, ground-nuts, rubber, palm nuts and oil, hides, horns, mats, and gold; among the chief imports are tobacco, cutlery, beads, clothing, calicoes. The total imports were estimated at 25,000,000 francs and the exports at 12,000,000.

A railway is open from Dakar to Rufisque and thence northwest to St. Louis, at the mouth of the Senegal; another railway is under construction from Kayes, also on the Senegal, to Bamaku, on the Niger, and in 1899 about one-third of it was open for traffic.

SENN EXPEDITION. See ZOOLOGICAL STATIONS.

SEPTICÆMIA, PUERPERAL. See **SERUM THERAPY.**

SEPTIC TANK. See **SEWAGE PURIFICATION.**

SERUM and SERUM THERAPY. The search for immunity is as old as antiquity. Dr. Nicolas Lambadarios, of the University of Athens, has published a volume on the serum therapy, organotherapy, antirabic, and antileprous treatment of the old Greek physicians. Galen used the flesh of the viper's body as an antivenene. Mithridates fortified himself by taking all the known antidotes, and experimented also upon condemned criminals; finally succeeding in rendering himself immune to snake-bite. For the latter purpose he took the blood of animals which fed on venomous snakes. Attalus, King of Pergamos; Andromachus, Nero's chief physician; and Galen used similar antidotes. Dioscorides advised persons who had been bitten by mad dogs to drink the blood and eat the liver of the animals which had bitten them.

Blood-Serum.—The germicidal action of blood-serum has been tested by Franklin W. White upon cultures of staphylococci, streptococci, typhoid bacilli, and colon bacilli. Blood-serum from 23 healthy persons showed practically no germicidal power over the staphylococcus or streptococcus, but a marked germicidal action on the typhoid bacillus. Blood taken from 10 cachectic people suffering from various diseases also exhibited marked germicidal power over the typhoid and colon bacilli. The blood removed from a number of persons in the death agony or a few hours after death was strongly germicidal against typhoid or colon bacilli. None of it was actively germicidal toward staphylococcus or streptococcus.

Milk-Serum.—Laraboullet, of the Académie de Médecine de Paris, described in July the researches he and Gimbert made regarding milk-serum. It is thus prepared: Fresh cow's milk is coagulated, the whey is filtered off, and the curd dried, pulverized, mixed with chalk, and then soaked 1 to 2 hours in the whey. After filtration and sterilization a little carbolic acid is added as a preservative. He has found that neurasthenia and grave forms of anæmia are rapidly improved by injections of this serum and of arsenic. Encouraging beginnings are reported in cases of pulmonary tuberculosis.

Anthrax and Serum Therapy.—Drs. Abba and Piccardi, of Turin, report the twenty-seventh case of anthrax which has been successfully treated with Professor Sclavo's anti-anthrax serum. The diagnosis was confirmed by inoculations of guinea-pigs with fluid from vesicles appearing around the pustule in the case. After two injections the case went on to recovery after a week's observation.

Diphtheria Antitoxin.—Dr. Herman M. Biggs, of the New York Health Department, reports 3073 cases of diphtheria treated with antitoxin from January, 1895, to January, 1900, with 429 deaths, or an average mortality of 13.9 per cent. If 172 cases of moribunds be omitted, the mortality is 8.8 per cent. The serum was used for the production of immunizing on 5108 persons, of whom 48 had diphtheria. The dose for immunizing is 15 to 20 minims of a high-grade serum. An initial dose of serum for combatting diphtheria is from 2500 to 4000 units. The protection from immunization lasts about 3 or 4 weeks. Of 826 cases of laryngeal diphtheria, 26.5 per cent. were fatal. In the 204 in which intubation was done the mortality was 36 per cent. In New York City there were in 1894, 2874 deaths from true diphtheria as compared with 923 in 1898. In Paris, France, there were treated in the hospitals in 1894, 2355 cases, with a mortality of 35.5 per cent., whereas in 1897 there were 1683 cases, with 15 per cent. deaths. It is calculated that in Chicago, as a result of the antitoxin treatment, there has been a clear gain of 1100 lives in two years past.

Pneumonia and Serum Therapy.—Drs. Eyre and J. W. Washbourn, of Guy's Hospital, London, report the results of an investigation they made in 1899 into the efficacy of the antipneumococcic serum of Dr. Pane. The serum appears to have widely protective powers, and the experimenters anticipate further success in its use. They found that the serum in doses of 1 cubic centimetre possesses for rabbits a considerable protective power against 4 out of 5 strains of pneumococci derived from different sources, having no protective power against 1 strain, obtained from a fatal case of pneumonia. They decided that there are varieties of pneumococcus which at present can be distinguished only by the action of the antipneumococcic serum.

Puerperal Septicæmia.—Antistreptococcal serum reduced the mortality of puerperal septicæmia to 25 per cent. in cases treated by Dr. E. Rosenthal, of Philadelphia. He does not regard the serum as a specific, but believes it has a well-defined value. Repeated injections are necessary. Arthur reports the recovery of a case after 8 injections of 10 cubic centimetres each of streptococcus serum during 9 days.

Swine Plague and Hog Cholera.—The Bureau of Animal Industry of the United States Department of Agriculture issued in 1899 a report on the experiments in 1897 and 1899, with the results of the respective causative micro-organisms of hog cholera and swine plague. In the first year, of 196 animals treated with the mixed

serums, 161 were saved, or 82 per cent., while only 15 per cent. of the 429 control animals not so treated recovered. In 1898, 1727 animals were treated with the serums, and 1304 recovered, or 76.84 per cent., while of 3197 control animals not so treated only 600 survived, or 28.76 per cent. It has been estimated that the State of Iowa alone loses \$15,000,000 annually by the death of hogs from diseases, whose proper treatment, at a very small cost, would save at least \$11,000,000.

Antitubercle Serum.—Dr. Stubbart, physician to the Loomis Sanitarium for tubercular patients at Liberty, N. Y., has employed bovinized antitubercle serum in 82 cases of pulmonary tuberculosis. His figures are as follows: Expectoration improved in 82 per cent. of the cases, appetite improved in 81 per cent., weight increased in 78 per cent., temperature diminished in 49 per cent., disappearance of tubercle bacilli in 13 per cent., apparent immunity obtained in 21 per cent., diminution of the bacilli in 35 per cent., improvement in cough in 79 per cent., general improvement in 78 per cent. In cases of laryngeal tuberculosis, healing of ulceration took place in 50 per cent. when present; arrest of the disease occurred in 46 per cent. of the cases in which ulceration was not present. Stubbart has used anti-streptococcic serum in six cases of tuberculosis with mixed infection. In the first case, the expectoration ceased after one injection for several days. In the second case, cough and expectoration increased after the injection, but subsequently decreased. The third patient, who had a dry cavity at one apex, received four injections, after which the streptococci disappeared. The fifth case received two injections, after which the streptococci disappeared for five months, and then returned. The sixth patient had no streptococci in his sputum for six weeks after the injection.

Calmette's Antivenene.—Arthur Beveridge reports in the *British Medical Journal*, for December, 1899, that a man bitten by a cobra was saved by the use of 10 cubic centimetres of Calmette's antivenene injected hypodermically an hour after the encounter. The wound was excised, and nitric acid was applied. Stimulants were used, and improvement was gradual. In a few hours he was able to walk unaided, though staggering and complaining of weakness. In four days he returned to work. Antivenene is prepared from the blood-serum of animals previously inoculated with snake poison. It was devised by Dr. Albert Calmette, director of the Pasteur Institute at Lille, France. It is stated that Surgeon-General Taylor is taking steps to have a supply of Calmette's antivenene issued to all military hospitals in India.

Yellow Fever Under Serum Treatment.—Very little has been published during 1899 with reference to the use of Sanarelli's anti-amarillic serum. A large quantity of the serum was prepared by Dr. Fitzpatrick, bacteriologist of the Health Department of the city of New York, and sent to Vera Cruz for experimental purposes. It was used on one of the two reported cases of yellow fever which came to the port of New York during the year, both being brought on the transport *McClellan* from Santiago; but there was some doubt about the diagnosis in this case. The patient recovered.

Knorr and the Relation of Toxin to Antitoxin.—The relation of antitoxin to toxin has been a problem. Behring and Ehrlich put forth the theory that the action of antitoxin on toxin was a direct neutralization of the one substance by the other. Büchner's theory was that of an indirect physiological antagonism. Angelo Knorr, of Munich, who died in 1899, held that the two entered into a loose combination, whereby the action of the toxin on the body-cells was suspended. He demonstrated this fact by heating neutral mixtures of tetanus poison and antitoxin, and comparing the result with the effect of heat on mixtures of simple serum and tetanus poison. In the first mixture heat had no power to destroy the toxin, while in the case of the control-mixture, in which the serum contained no antitoxin, heat destroyed a part of the tetanus toxin. The union of the two substances cannot be compared with the ordinary chemical combinations. Büchner accepted Knorr's theory. Another interesting fact discovered by Knorr, says the *Philadelphia Medical Journal*, is the following: "When toxin and antitoxin are mixed so that an excess of the former is present, the physiologic action of the surplus does not correspond to its amount—that is to say, 100,000 toxin-units present in excess in a mixture of toxin and antitoxin do not produce proportionate effects. Their effects are only equal to those produced by 20 units acting alone—that is, not in a neutral mixture. Yet, in order to prevent the action of this excess, not 20, but 100,000 antitoxin-units are necessary. Knorr had also found that the less the concentration of the two bodies, the more antitoxin was necessary to neutralize promptly and completely a given quantity of toxin. In one of his last papers he brought forward apparently strong proof against Ehrlich's 'lateral chain' theory of immunity. Ehrlich attributed the formation of antitoxin to the action of the cells attacked by the poison; Knorr, on the other hand, made the unattacked cells the antitoxin producers. Had he lived, there is no telling how near he would have brought us to an understanding of the problems of immunity." See DIPHTHERIA; LEPROSY; PLAGUE; TYPHOID FEVER.

SERVIA, an independent kingdom, formerly tributary to Turkey, is an inland state surrounded by Austria-Hungary on the north, Roumania and Bulgaria on the east, Turkey on the south, and Bosnia on the west. Its area is 19,050 square miles, and its population, according to the census of 1895, 2,314,153. Belgrade is the capital, with a population in 1899 of about 60,000. The trade is fairly good, the imports, which have greatly increased, in 1898 amounting to about \$8,000,000, and the exports about \$11,000,000. The principal exports are animals, animal and dairy products, and fruits, especially prunes, which are sent mainly to Austria-Hungary, Germany, and the United States. The imports consist largely of textile goods, sugar, hardware, etc. The principal occupation is agriculture, but there are a number of carpet-weaving, jewelry, and other industries. The mineral resources, though said to be considerable, are undeveloped. The railway mileage was slightly over 350 in 1896. On the borders of Servia there are about 300 miles of navigable waters in the Danube, Save, and Drina rivers.

The government is vested in the King and the *Skupstina*, or national legislature. There is a provisional constitution in force pending a new one proposed, whereby the government controls the appointment of one-third of the members of the legislature, while the other two-thirds are elected under a restricted form of open voting, without the use of ballots. In other ways the crown has arbitrary powers, including great power over the press. There are three principal political parties—the Radicals and the Liberals, who look to Russia for support, and the Progressives, who turn to Austria. Russia is supposed to be displeased at the continuance of ex-King Milan as commander-in-chief of the forces of King Alexander, his son, and the departure of the Russian minister from Belgrade in March was attributed to this cause. In July an attempt was made to assassinate Milan by a man named Knezevitch, a Bosnian, who was arrested, and after a trial publicly shot. Knezevitch implicated a number of others in the plot, and many arrests were made, including several prominent Radical leaders, but he made so many conflicting statements that little reliability could be placed upon his word. However, 28 persons were tried, 22 of whom were judged guilty. M. Taushanovitch, a former minister of the interior and of commerce, was sentenced to 20 years' penal servitude, and 8 were condemned to an imprisonment of 9 years. Among these was the Radical leader, Pasitch, who was pardoned by King Alexander. The affair attracted considerable attention in Europe, and although the Servian government alleged that the attempted assassination was part of a conspiracy to overthrow the Obrenovitch dynasty in the interests of the Karageorgevitch pretender, the trial was believed by many to be an unfair one, a recent writer drawing a parallel between it and the Dreyfus court-martial, in respect to the methods of the prosecution. The *Revue Politique et Parlementaire*, of Paris, accused Milan of making the affair an opportunity to avenge himself upon his personal enemies by attempting to implicate them in the plot. It calls the charges against some of these men a tissue of futile and absurd statements, although it sees nothing strange in the action of Milan, whom it brands as a man of no character or conscience. It concludes: "There is no doubt that a Nemesis will come some day under the form of a revolution or the like, provoked by a deep indignation. Milan will then receive the reward of his deeds. If fortune favors him, he will perhaps merely be sent back to the company of those whom he left, in violation of his agreement, and will return and govern Servia in the name of his son. Meanwhile, the presence of this man in Belgrade constitutes a permanent danger to the tranquillity of the Balkan states, where there are already so many causes for trouble."

SERVIOE, JAMES, was born in Ayrshire, Scotland, in 1823; died in Melbourne, April 11, 1899. At about twenty years of age he emigrated to Australia, and entered business. He was elected to the legislative assembly for Melbourne in 1857; was minister of lands, 1859-60; represented Malden in the assembly from 1874 to 1881. In the former year he was treasurer of Victoria, and premier in 1880. He was premier again of the coalition government of 1883. Afterward he entered the legislative council (the upper house), of which he was a member at the time of his death.

SEWAGE PURIFICATION. In July, 1899, the city of Paris celebrated the completion of its new sewage farms and other works, designed to divert the remainder of the sewage of the city from the Seine. The two new farms provided in recent years add 7655 acres to the area previously set aside for this purpose, making a total area of 12,340 acres devoted to sewage farming by the city of Paris. Not all of this land has yet been made available for the purpose, but it appears that at least 10,000 acres are in actual use. The various farms—Gennevilliers, Archères, Mery-Pierrelaye, and Carières-Trill—are located at some distance from the city. The sewage is brought to them through large conduits, and is lifted several times by huge pumps. Berlin has some 20,000 acres (perhaps more) devoted to

sewage farming. London is still partially purifying its sewage by chemical precipitation, and carrying the resulting solids, or sludge, to the ocean in great sludge ships. The volume of sewage is now getting to be so large that more complete purification is desirable, and will soon be imperative. To meet this need, and in hope of simplifying the sludge problem, extensive experiments are being made with filtering the sewage through beds of broken coke. The coarseness of the filtering material permits the beds to be filled and emptied rapidly, thus drawing in air clear to their bottoms, utilizing the whole depth and increasing the rate of filtration over what is possible with intermittent filtration. Bacteria beds and contact beds are terms applied to these filters, and to similar ones recently constructed at other places in England. Thus far such filters have not been put into practical operation on a large scale in the United States, but at the Lawrence Experiment Station of the Massachusetts State Board of Health good results have been attained. Sewage purification by means of intermittent filtration and broad irrigation, or sewage farming, is also a bacterial process, but there is less bacterial activity. The aim of the newer processes is to secure higher rates of treatment, thus economizing in the area required and in the cost of construction. A further aim is to reduce the amount of sludge which accumulates on the surface of the disposal areas, or in the spaces between the filtering material.

The bacteria employed in the processes already mentioned work in the presence of air, and hence are called *aerobic*. Opposed to this is the septic tank, which is merely a receptacle where sewage is held and allowed to pass through slowly without being subjected to the influences of much light or air. These tanks are designed to utilize the *anaerobic* bacteria, which work in the absence of air. The septic-tank system is being extended in England, and is now in use in this country at Champaign, Ill., at a golf and polo club near Chicago, and at an insane asylum at Verona, N. J. Contracts for such tanks were let in 1899 at Independence, Mo., and Vancouver, British Columbia, and the system was adopted for Marion, Ia. Experiments with the process have been conducted at the Lawrence Experiment Station. They indicate that the tanks need not be so large as those employed in England, and that they probably need not be covered. The English tanks have been built large enough to store the sewage flow of the whole 24 hours, and have been provided with masonry roofs. It seems sufficient to have the tanks large enough only to give time for a fair amount of sedimentation, since the retained organic matter is supposed to remain in the tank until decomposed by the *anaerobic* bacteria, after which it passes off in a soluble form. It is then readily acted upon by *aerobic* bacteria, either upon being discharged into filter beds or water, the latter course being unobjectionable if the water is not used for drinking purposes, and if it is sufficient in volume to provide the requisite amount of dilution. At Manchester, England, it is proposed to transform the chemical precipitation tanks into septic tanks, uncovered, and to pass the septic-tank effluent through so-called contact beds. At Sutton, Surrey, chemical precipitation tanks are being changed into coarse contact beds, from which the sewage goes to and through beds of finer material.

At Providence, R. I., works are nearly completed for the treatment of the sewage by chemical precipitation. This is the largest city in the United States that has attempted to purify its sewage. New York discharges its sewage into the adjacent waters, which have so great a volume that comparatively little offence arises from the practice. Some of the districts recently annexed to New York, however, have purification works. At Boston large sums have been expended to divert the sewage from the old outlets near the built-up portions and discharge it at remote points, in deep water. (Other municipalities have joined in this work, as stated more fully under the article SEWERAGE.) The joint outlets so provided discharge into the harbor and are under the control of the Metropolitan Sewerage Commission. Recently the commission made some very interesting studies to determine the effect of the sewage so discharged upon the waters of the harbor. Buoys were placed at intervals over quite a large area adjacent to the outlets, and visual observations made and samples of water taken for chemical examination at regular intervals. The studies showed that the large volumes of sewage discharged from these outlets were soon dissipated by the effects of tides and currents. Although not commonly classed as sewage purification, disposal by dilution is in many cases the best possible means of getting rid of sewage. The free oxygen of the water and the various lower forms of life which it contains soon change the organic matter of the sewage to harmless compounds, making it available for plants and animals of higher order. Of course, all this presupposes that a given volume of water is not overloaded with sewage, so that offensive deposits and odors result and living organisms are driven away.

One of the most notable examples of disposal by dilution will be provided by the Chicago Drainage Canal, which was nearly ready to be put in operation at the close of 1899. This canal will receive all the sewage of Chicago, dilute it by many times its volume of water and convey it to the Des Plaines River, which in turn connects

with the Illinois and that with the Mississippi. (See CANALS.) The canal is designed on the principle that if the sewage wastes of each inhabitant are discharged into water equal in volume to a flow of 0.2 cubic feet per minute, or 2000 gallons a day, no offensive decomposition or deposits will occur. It was not supposed by those who designed the canal that its use would affect any public water supplies, but St. Louis, some 375 miles below, began to protest last summer that its water-supply would be endangered, and to take steps in the courts and in Congress to prevent the opening of the canal. During the year an exhaustive series of analysis of water from the streams into which the canal will discharge was begun in behalf of the sanitary district of Chicago. This will be continued after the canal is put in operation in order to show what changes follow. A large part of the sewage of Chicago has been sent down through the old Illinois and Michigan Canal, and the rivers to the south, for years past, and more or less of it has gone that way ever since the city had a sewerage system. See SANITATION (paragraph Sanitary Legislation).

SEWERAGE. A complete sewerage system includes means for the collection and disposal of sewage. The latter phase of the subject is treated under Sewage Purification. Under collection, it may be noted that Chicago is preparing to build large intercepting sewers to divert its sewage from the lake to the new drainage canal (which see under CANALS). Baltimore and New Orleans, two of the largest American cities, are still without sewers for the removal of house wastes, but Baltimore has spent large sums of money for sewers (more properly drains) to remove surface water, and New Orleans is improving its old ditches or canals. The latter city has recently voted to construct a thorough sewerage system and enlarge and complete the canals designed for surface and sub-surface drainage. Some years ago the city granted a franchise for sanitary sewers (those removing house wastes) to a private company, but the company went into the hands of a receiver before much work had been done. A suit for the annulment of the franchise was begun by the city some time ago. There are some twenty cities and towns in the United States whose sewerage systems are owned and operated by private companies. Among these are: Atlantic City, Englewood and Long Branch, N. J., Galveston, Tex., and Phoenix, Ariz. In some cases the companies are operating under detailed municipal franchises, which specify the yearly rates to be charged householders for the privilege of using the sewers, and in others a less formal agreement, or a mere permit to occupy the streets, is all that defines the relations between the companies and municipalities. Private ownership of sewers, it hardly needs be said, is not looked upon with favor by engineers, sanitarians, or city officials generally, sewerage facilities being too closely allied to the health and police functions of municipalities.

In some localities local conditions favor joint action on the part of two or more municipalities in the construction and operation of trunk or outlet sewers from the collecting systems to the point of final disposal. Such action was authorized in 1809 by the New Jersey legislature, and in addition an act was passed providing in detail how such a scheme might be carried out for some of the Oranges, a small part of Newark and other and smaller places. In Massachusetts, the Metropolitan Sewerage Commission has completed three large outlet sewers which serve portions of Boston and many towns in the vicinity. Up to October 1, 1899, the following twenty-three cities and towns were included either wholly or in part in the three joint systems under the charge of the commission: Arlington, Belmont, Boston, Brookline, Cambridge, Chelsea, Dedham, Everett, Hyde Park, Lexington, Malden, Medford, Melrose, Milton, Newton, Somerville, Stoneham, Wakefield, Waltham, Watertown, Winchester, Winthrop, and Woburn. In a few instances the towns were not wholly connected with the Metropolitan outlets, but it was estimated that a total of 394,000 inhabitants of a possible 578,000 were so connected, embracing an area of 41.44 miles out of 164.28 miles that will eventually contribute sewage, most of the municipalities already connected being as yet only partially provided with sewers. In all 727 miles of local sewers are connected with the Metropolitan system, and 60,865 buildings are connected with these local sewers. One of the districts served makes use of the outfall portion of the Boston main sewerage system, which to October 1, 1899, had cost the city of Boston about \$6,500,000. To the same date the Commission had expended nearly \$7,000,000 in construction, while \$4,600,000 additional is the estimated cost of its prospective work. The actual mileage of the Metropolitan sewers on the date named was 70, mostly of large size. Several large pumping plants are in use. All the sewage collected is discharged into Boston harbor without treatment, except that that which flows through the old Boston outlet is stored in reservoirs and discharged on the outgoing tide. See SEWAGE PURIFICATION and SEWER GAS.

SEWER GAS, or more properly sewer air, has been studied during the past few years to determine its relation to the spread of zymotic or filth diseases. The following conclusions are drawn from these studies by George Newman in his recent (1899) work, *Bacteria*: Sewer air generally contains fewer micro-organisms than the out-

side air, and the bacteria in sewer air are commonly those of the outside air rather than those in the sewage. "Sewer air neither conducts pathogenic organisms nor stimulates the virulence of such." Notwithstanding these conclusions, sewers should be built so as to prevent the generation or accumulation of putrefactive gases. This can be effected by uniform grades, smooth interiors, and proper ventilation, for sewer air, like any other impure air, may tend to weaken the system, thus making it susceptible to the approach of disease germs from other sources than sewer air.

SEXTON, Colonel JAMES A., commander-in-chief of the Grand Army of the Republic, died in Washington, D. C., February 5, 1899. He was born in Chicago, January 5, 1844. At the outbreak of the Civil War he enlisted and soon rose to the position of first lieutenant and then of captain. He served in Ransom's division of the Army of the Tennessee. He participated in the battles of Columbia, Spring Hill, Duck River, Franklin, and in the campaign before Nashville. In the battles of Nashville and Franklin he was wounded, and at the capture of Mobile suffered a fractured leg. In the latter part of the war he was on the staff of Major-General Smith, commander of the Sixteenth Army Corps. The two years following the war he passed on a plantation near Montgomery, Ala. He went to Chicago in 1867 to engage in business, and founded the firm of J. A. and T. S. Sexton, which was succeeded after the Chicago fire by Cribben, Sexton and Company. In 1889 President Harrison appointed him postmaster of Chicago. He had been a colonel in the Illinois National Guard and a Presidential elector, and in 1898 he was chosen commander of the Grand Army. Besides working in this organization he was actively interested in several other military societies. At the time of his death Colonel Sexton was a member of the commission appointed by President McKinley in the early fall of 1898 to investigate alleged abuses in the War Department.

SHAKERS, a communistic society, called by its members the United Society of Believers in Christ's Second Appearing, originated in England in the eighteenth century, but is now existent only in Massachusetts, New Hampshire, Maine, Connecticut, Ohio, Kentucky, Georgia, and New York. In the last-named State, at Mount Lebanon, is one of their largest settlements. A so-called family was started in White Oak, Ga., in 1899 by Shakers from Ohio. There are 30 families in the society, with from 5 to 100 persons in a family. The total number of Shakers was estimated in 1899 by a member of the Mount Lebanon society as being about 1000.

SHALE. See MINERAL PAINTS.

SHAW, Colonel ALBERT DUANE, commander-in-chief of the Grand Army of the Republic, was elected to that position at the twenty-third annual encampment, held in Philadelphia September 4-8, 1899, to succeed Colonel James A. Sexton, who died in February. Colonel Shaw was born at Lyme, Jefferson County, N. Y., December 27, 1841. He was a student at Union Academy in Belleville when the war broke out in 1861, and in May he enlisted in the Thirty-fifth New York Volunteers. He served as a private and non-commissioned officer until 1863, and then as a recruiting officer at Watertown, N. Y. He made a good record in his regiment and took part in many engagements, including Bull Run, Chantilly, Rappahannock Station, South Mountain, Antietam, and Fredericksburg. After the war Shaw entered St. Lawrence University, at Canton, and was graduated in 1867. In the same year he was appointed colonel of the Thirty-sixth Regiment of the New York National Guard, and was elected to the assembly from Jefferson County. He was United States consul at Toronto from 1868 to 1878, and at Manchester, England, from the latter year to 1886. In 1897 he was elected deputy commander of the Grand Army. Colonel Shaw has been largely interested in the development of electric power at Niagara Falls, and is president of the Canadian Niagara Power Company.

SHELDON, CHARLES M., clergyman and author, was born in Wellesville, N. Y., something over forty-one years ago; he spent his early life on a farm in Dakota, and was educated at Phillips Academy, Andover, Mass., Brown University, and Andover Theological Seminary. In 1886 he went to London and studied there the conditions of the poorer classes. In 1888 he became the pastor of the Central Congregational Church, Topeka, Kan. Publications: *Richard Brice*, 1891; *Robert Hardy's Seven Days*, 1892; *The Twentieth Door* and *The Crucifixion of Philip Strong*, 1893; *John King's Question Class*, 1894; *His Brother's Keeper*, 1895; *Malcolm Kirk*, 1897; *In His Steps, The Redemption of Freetown, One of the Two*, and *The Miracle at Markham*, 1898; *For Christ and the Church*, 1899. Most of these books Mr. Sheldon read from his pulpit, chapter by chapter, in lieu of a regular sermon. Since publication they have had a sale of over three million copies in America, Canada, and England. *In His Steps* is being translated into German, French, Swedish, Norwegian, Spanish, Italian, Armenian, Russian, and some dialects of Central and Western Africa. This book was written from the point of view of the question, "What would Jesus do?"

SHIPBUILDING. The tonnage of ships built during 1899 was large. As usual Great Britain led all other countries in the tonnage of new vessels launched. Of the total tonnage of 1,763,914 tons, the yards on the Clyde and elsewhere in Scotland contributed 536,590 tons, those on the Tyne, 291,293 tons, and those on the Wear, 268,508 tons. The following are some of the other interesting figures of British shipbuilding during the year:

Class.	No. Vessels.	Tonnage.
Steam vessels.....	825	1,066,808
Sailing vessels.....	808	47,085
Total I. H. P. of machinery.....	...	1,397,577 H. P.

The largest output of any single British shipyard was that of Harland and Wolff of Belfast, Ireland, aggregating a tonnage of 82,634 tons. The output of the yards of all other countries for the years 1899 and 1898 was divided as follows:

Country.	1899.		1898.	
	No.	Tons.	No.	Tons.
United States.....	149	268,964	187	216,164
Germany.....	132	179,235	155	173,164
Holland.....	90	70,327	77	43,324
Italy.....	18	67,897	12	24,537
Denmark.....	15	23,607	17	12,448
Norway.....	30	30,361	31	20,206
France.....	8	19,686	11	12,708
Belgium.....	23	9,875	15	8,150
Sweden.....	18	6,358	21	11,094
Austria-Hungary.....	6	1,956	18	11,540
Canada.....	4	825	28	18,443
Spain.....	...	.....	1	15
Japan.....	...	.....	3	10,428
China.....	...	.....	43	2,140
Total.....	493	683,625	569	575,694
Great Britain.....	...	1,763,914	...	1,673,655
Grand Total.....	...	2,447,539	...	2,250,539

Compared with 1898 the total output of vessels built during 1899 showed an increase of about 200,000 tons, of which 108,140 tons was in countries outside of Great Britain. It will be noticed that the United States ranks next to Great Britain in the number and tonnage of ships constructed during the year. Among the particularly notable vessels launched in 1899 were the steam turbine-propelled torpedo-boat destroyer *Viper* of the British Navy, with a speed of 35 knots per hour, and the transatlantic steamer *Oceanic*, the largest vessel now afloat, and having the following principal dimensions: Length over all, 704 feet; extreme breadth, 68 ft. 4½ in.; depth, 49 feet. See NAVAL ENGINEERING.

SHOOTING. Rifle, revolver, and trap events in 1899 were numerous. The Grand Prix du Casino, the most valuable prize known to wing-shots, was won at the international tournament at Monte Carlo in 1899 by M. Moncorg. In the United States the most important event is the Grand American Handicap (25 live birds), which was won at Long Branch, N. J., by Thomas A. Marshall, of Illinois, 29-yards handicap. The entry list was 278. Marshall tied with five others on 25 kills, and won with a kill of 58 straight on the shoot-off. The amateur wing-shooting championship was won by G. S. McAlpin, with 96 kills, at the Carteret Club grounds, Long Island, N. Y. The intercollegiate shoot in May resulted: Pennsylvania 117, Harvard 114, Princeton 107, Yale 103; in November: Harvard 112, Yale 108, Pennsylvania 104, Princeton 102. The first telegraphic intercollegiate shoot occurred in 1899, Harvard defeating Yale 1363 to 1036. In a team shoot Princeton beat Columbia 75 to 73. Five notable individual records were made in 1899, and quoted from the *Clipper Annual* are as follows: Rifle—250 out of 250, Louis Flach, ring target, 25 yards range, New York City, November 4; 2425 points out of 2500, F. C. Ross, German ring target, 100 feet, 22 calibre, New York City, March; revolver—125 out of 125, C. S. Richmond, army revolver, 25 shots at 50 yards, Savannah, Ga., July;

trap shooting—in match, 100 successive kills, J. A. R. Elliott, Kansas City, October; 211 inanimate targets broken straight, unknown angles, C. A. Young, Peoria, Ill., May.

SIAM is an independent kingdom and the chief state of Indo-China. It is bounded on the western side by the province of Burmah, in British India, and on the eastern by the territory of French Indo-China. It borders the Gulf of Siam on the south. The western portion, including the Malay states dependent on Siam, touches also the British protected Malay states of the Straits Settlements. Its territory has been reduced from about 300,000 square miles to about 200,000 square miles, whereby France has added to her Indo-Chinese possessions, and France has a certain amount of jurisdiction over Siamese administration within a limited territory west of the Mekong River, and Great Britain has certain rights over the western dependencies. The central portion of the kingdom, including the basins of the Menam, Petcha Bourri, and Petriou rivers, is recognized as under the complete jurisdiction of Siam. Estimates have placed the population at from 5,000,000 to 12,000,000. The United States Consular Reports placed it in 1898 at about 8,000,000. The present King is Chulalongkorn I., under whose rule the kingdom has prospered and has come to be considered next to Japan in progressiveness and receptiveness to new ideas. A number of Europeans are employed in the service of the state, and several Siamese young men are sent to Europe for their education. Bangkok, the centre of foreign trade and the market for a very populous region, is one of the most interesting cities in the Orient. Recent estimates place the inhabitants at from 600,000 to 800,000, and the population is rapidly increasing. Bangkok has an electric street railway, built mostly from American materials. According to a report in 1899, this railway is crowded all day long, and pays a dividend of 12 per cent. There are also electric lights, telegraphs, telephones, railroads, hotels, libraries, and banks. The latter are said to be excellent. Even the bicycle has found favor, the following account of its recent introduction being given in the *Moniteur Officiel du Commerce*, of Paris, in April, 1899: "Almost simultaneously American and English firms have placed numerous models of their manufactures on the market at Bangkok. At the present time not only is the bicycle met everywhere in the streets of the capital, but it has also penetrated into the interior. Europeans are not the only ones seen on bicycles; the Siamese and even the Chinese, in spite of the inconvenience of their form of dress, have readily adopted this mode of locomotion. The majority of machines now used in Siam are American, English, or German makes; a few French and Belgian are also seen. The demand for American wheels is strong, as they have the reputation of solidity as well as cheapness. Rubber pedals are preferred, as many Siamese and Japanese ride without shoes." Bangkok's trade is facilitated by a good harbor on the river Menam and by regular steamship lines between Hong-Kong and Singapore. In 1898 the imports at this port were \$12,759,542, the items being: Treasure, cotton, silk and piece goods, gunny bags, kerosene, sugar, hardware, machinery, and other iron goods. The exports in 1898 were valued at \$16,988,520, showing the large increase of over \$6,000,000 over the export trade of 1897. The chief item of export is rice; others are teak-wood, sandal and rosewood, pepper, treasure, oxen, hides, and garden products.

The public improvement and development of Siam has practically been brought about during the present decade. Ten years ago there were only 9 miles of streets in Bangkok, communication being had by the canals which traverse the entire city, with a total length of 75 miles in 1899. To-day there are nearly 50 miles of streets, and the old bridges are being replaced with modern steel ones. It is said that the King builds each year out of his funds as a gift to the city one steel bridge, which is opened with ceremony on his birthday. Not only the city but the entire country is traversed with canals, which connect the three great tidal rivers. They serve as highways, and were until ten years ago the only means of communication, excepting byways through the jungle. They are also utilized for irrigating purposes. The company which has for ten years constructed many of these highways and irrigation canals has brought under cultivation a large tract of formerly uninhabited swamp and jungle, which is now occupied by 70,000 people. The King has an extensive canal programme for the development of rich waste lands, and is reported to have already sent to Holland for engineers. The first railroad was opened in 1893, and runs from Bangkok to Paknam, 14 miles. The second was begun in 1892, and was nearly completed in 1899. It is built by the government, of standard gauge, at a cost of nearly \$33,000 gold per mile. It connects Bangkok with Korat, 165 miles. Another road building in 1899 will run from Ban Mayee to Chiengmai, 400 miles. A franchise was granted for a light railway from the Menam to the Nakawn Nayokey River. The King has also a railway programme for the building of lines east and west, aggregating over 500 miles of railway, but a loan may be necessary to carry it through. A line is under consideration in Bangkok to connect that city with the Burmah frontier.

SIBERIA has attracted considerable attention in recent years, owing to the construction of the great continental railway which is being built by the Russian government, and to the development and settlement of the extensive regions which had until recently been considered barren and largely valueless. Siberia stretches from the Ural Mountains to Bering Straits and the Pacific, and from the Arctic Ocean to the borders of the Chinese Empire. Several great rivers enter the Arctic—the Obi River, over 3500 miles long; the Yenisei and Angara, 3200, and the Lena, 2800, while the Amur enters the Pacific after traversing the southern part of the country. While the northern harbors are frozen many months in the year, steamers and tugs operate on the Obi and the Yenisei, and in the south it is possible to grow not only grains, but even fruits. In the summer of 1898 Russian and English steamers appeared at the mouth of the Obi and of the Yenisei, proving it possible to secure open-water communication between western Europe and the Orient. The total area of Siberia is 5,000,000 square miles, with a population of from 5,000,000 to 6,000,000, half of whom represent semi-nomadic tribes.

Agricultural Possibilities.—There has been much speculation in regard to the agricultural possibilities of Siberia, one writer of some note having called it the future wheat chamber of Europe. The cultivable area of Siberia is put down at about 425,000 square miles, or about equal to Iowa, Missouri, Kansas, Nebraska, and the Dakotas. In western Siberia the climate is said to be much like that of western Canada. Southward the climate is said to approach that of Italy, but severe droughts occur. Western Siberia has less favorable climatic conditions than eastern Siberia, but it is richer in forests, and also has a greater amount of live stock. Southward again the cultivable area improves. It may be said that the more desirable sections of Siberia have already been extensively settled. The methods of culture are still primitive, and the live stock, though more numerous in proportion to population than in European Russia, are of inferior grade. The agricultural importance of the country at the present time is, it may be concluded, potential rather than actual.

Minerals and Forests.—There are rich deposits of gold, silver, copper, iron, and lead, besides tin and mercury ores, coal and lignite, graphite, sulphur, naphtha, salts, mica, and precious stones. There are also important mineral and hot springs. The mineral resources are not only rich and varied, but of great extent. The estimated annual output is already over 25,000,000 roubles (1 rouble = \$0.514). This will be very greatly increased upon the introduction of modern mining machinery and improved methods of extraction. The forests are extensive and valuable.

Immigration.—The intention of Russia to develop Siberia led to the abandonment in 1899 of the idea to continue that colony as a penal settlement. Recently a systematic effort at colonization under government direction and assistance has been begun, and hundreds of thousands of Russian peasants have been assigned to lands throughout Siberia. Since 1892 the number of new settlers has steadily increased. During the eighties immigration averaged from 10,000 to 20,000 a year, but in 1896 it reached 200,000, and has maintained that figure each year up to 1899.

Trans-Siberian Railway.—The following may be mentioned among the important benefits accruing from the completion of the great railway which will connect the extreme Orient with the Russian capital and with the European centres, Berlin and Paris. Its greatest importance to Russia is, of course, its strategic character. It will probably become the great mail route and highway of travel between Europe and the East, and a probable competitor of the Suez Canal. It has been pointed out, however, that freight rates will for a long time be much lower by the water route than by rail. Again, the railway is expected to develop mining and agriculture in Russia and Siberia. It will also serve the purposes of industrial expansion, and it will facilitate immigration and materially aid the Russian policy of Siberian colonization. See further the articles **RUSSIA** and **RAILWAYS**.

SIERRA LEONE, a British West African possession, fronts on the Atlantic for about 180 miles, and is separated from the French settlements on the north by the Scarcies River, while Liberia bounds it on the south. The eastern frontier line was settled by an Anglo-French agreement of 1895, by which France gained control of the headwaters of the Niger. This river flows thence into the interior of the continent, and after describing an immense arc enters the ocean in Nigeria. The colony proper is a peninsula, and includes also the island of Sherbro. The area of the protectorate and colony together is variously estimated, but the more reliable authorities place it now at about 30,000 square miles. Estimates regarding the population are unreliable, ranging from 180,000 to 750,000. The most authoritative British manual places the population in 1899 at 250,000, which is the figure accepted by the United States Treasury Department reports. The resident Europeans number a little over 200. Freeport, the capital, with a population estimated in 1899 at 20,000, is one of the chief ports of West Africa. It has an excellent harbor, and is a British naval station of the second class. The trade during the period 1897-98

declined considerably, owing to much fighting between the British and natives, chiefly in the hinterland. The exports include palm oil and kernels, benni seed, kola nuts, India-rubber, ground-nuts, copal, and hides. In 1899 it was reported that the disturbances had largely ceased, and that peace and quiet were being restored. The native insurrection was brought about by a number of causes, the principal one, however, being the resentment of the natives toward the efforts of the British to collect the hut-tax. As the native dwellings are said to be mere mud hovels, the tax should not, in fairness, have been very great; but it has been said that in reality the amount charged was unreasonably large. The revolt which ensued was serious, lasting through the year 1898, and at the end of that time nearly all the huts which the British had proposed to tax are said to have been destroyed. In 1898 the late Sir David Chalmers was sent out as a special commissioner to investigate the causes of trouble. His report was submitted early in 1899, and strongly condemned the policy and administration of Sir Frederick Cardew, the governor of Sierra Leone. However, it was officially reported that fighting had ceased, and that the tax was being satisfactorily collected, and it was decided to continue the strong repressive measures of the governor. The government was therefore ordered to maintain the hut tax, with power to remit it in whole or part when thought necessary. Some concessions were made for policy's sake, the headmen of the towns and village communities being given a special commission for collecting the tax, besides the commission to the principal chief. It was decided that the native police should be retained in the ordinary administration of the protectorate. In 1899 a scientific party was sent to Sierra Leone by the Liverpool School of Tropical Diseases to investigate the causes of malaria. The physicians of the commission reported that the true malarial fever is caused solely by the mosquito, which carries infection from the swamps where it is bred. Should this theory prove true, it will be of immense value to the whole unhealthy coast of western Africa, for the commission reports that the destruction of the mosquito larva in the stagnant stretches and puddles in which it is found may be effected without great difficulty and with a large measure of success. A railway was opened in 1899 from Freetown to Songstown, 32 miles, which will be extended later to Rotofunk and Moyamba. Under the Colonial Loans act of 1899 an imperial loan of £310,000 was made to cover the cost.

SIGNALLING. See RAILWAYS (paragraph Signalling).

SILK MANUFACTURES. The steady growth of silk manufacture in the United States is shown by the following figures: In 1860, 13 per cent. of the silk used was manufactured at home; in 1880, 30 per cent.; in 1890, 55 per cent.; in 1898, 85 per cent.; in 1899, it is believed the tables were completely turned and the 87 per cent. of silk goods which in 1860 was imported, was last year manufactured in this country. Such silk goods as are now imported into the United States are principally fine product, largely from the hand-loom of Lyons, Crefeldt, and Zurich. It is estimated that fully one-third of the world's product of raw silk is handled in the mills of the United States. The raw silk comes from France, Italy, Austria, Spain, China, India, and the Levant; China produces both the largest quantity and best quality. From the days of the earliest Virginia settlers, periodic attempts have been unsuccessfully made to cultivate the silkworm. The industry requires so much time and labor that it will probably never thrive in America. Aside from the raw silk consumed at home in China and Japan, for which no records exist, the world's production of raw silk in 1898 was about 34,000,000 pounds, and for 1899 it is estimated at some 36,000,000 pounds. Our importations of raw and spun silk, mostly raw, have increased from 1,100,000 pounds in 1875 to 10,500,000 pounds for the year ending June 30, 1899, the importations for the latter year being valued at \$32,735,000. China alone produces about half of the raw silk of the world, and Japan and Italy come next. Of the 861 silk factories in the country, when the carefully written article (New York *Sun*, November 19, 1899) from which our figures are being drawn was prepared, New Jersey had 257; New York, 228; and Pennsylvania, 172. But while Pennsylvania stands third in this list, it is leading in the number and extent of new mills, judging from the fact that in 1898 it added 1255 looms out of a total of 2340 required for new equipment, and 37,000 out of 53,000 spindles. More than fifty Pennsylvania cities and towns have silk factories. The activity in this line in Pennsylvania seems to be largely due to low prices of coal, abundant cheap labor, and inducements held out to manufacturers on the part of municipal authorities. During 1899 a new mill was put in operation in Fayetteville, N. C., in which negro labor is to be exclusively employed. It is believed by the projectors that the young people of this race are well adapted to acquire the manual dexterity required in handling silk. The average wages paid silk workers are probably lower than in any other manufacture, this being due to the large amount of

female and child labor employed. According to a table in a recent report on the industry in Pennsylvania, the average wage is \$1.21 a day per male, and 70 cents a day for female labor.

SILVELA, DON FRANCISCO, who became prime minister of Spain on March 4, 1899, is the elder brother of a former minister, Manuel Silvela. He was born about 1845. He studied law under one of the most famous lawyers of Madrid, and was elected a deputy to the Cortes, where he was a Conservative. He served as minister of the interior in the cabinet of Martinez Campos in 1879-80; was minister of justice in the cabinet of Canovas in 1884-86, and minister of the interior again in the cabinet of Canovas in 1890-91. After the death of his brother he became the leader of the young Conservatives with liberal tendencies—a new party. Señor Silvela is a brilliant orator and a writer of ability. He was admitted to the Spanish Academy in 1893. On the resignation of the Sagasta cabinet on March 1, 1899, Señor Silvela succeeded in forming a ministry, and at the general election became prime minister of Spain.

SILVER. The production of silver in 1898, according to the director of the United States Mint, was as follows:

State or Territory.	SILVER.		State or Territory.	SILVER.	
	Fine Ounces.	Coining Value.		Fine Ounces.	Coining Value.
Alabama	100	\$129	Nevada	805,000	\$1,040,808
Alaska	92,400	119,467	New Mexico	425,300	549,883
Arizona	2,246,800	2,904,954	North Carolina	700	905
California	642,300	830,448	Oregon	130,000	166,081
Colorado	22,815,600	29,498,958	South Carolina	300	388
Georgia	500	646	South Dakota	152,300	196,913
Idaho	5,073,800	6,560,065	Tennessee		
Iowa			Texas	472,900	611,426
Maryland			Utah	6,485,900	8,385,810
Michigan	32,400	41,801	Washington	254,400	328,921
Minnesota			Wyoming	100	129
Montana	14,807,300	19,144,668	Total	54,438,000	\$70,884,405

SIMONS, REV. GEORGE HENRY, died in Brooklyn, N. Y., February 1, 1899. He was born in 1840 on the German island of Amrum in the North Sea. He followed the sea from the age of sixteen until he was twenty-seven, when, becoming converted, he entered a divinity school at Berea, O. He entered the Methodist ministry, and became active in organizing western churches. Later he came to New York City, where he was representative of the German Methodist Church at the Port Mission. From this post he was called to a church in Flatbush; his last charge was the Wyckoff Street Methodist Episcopal Church, Brooklyn. Mr. Simons published several religious works.

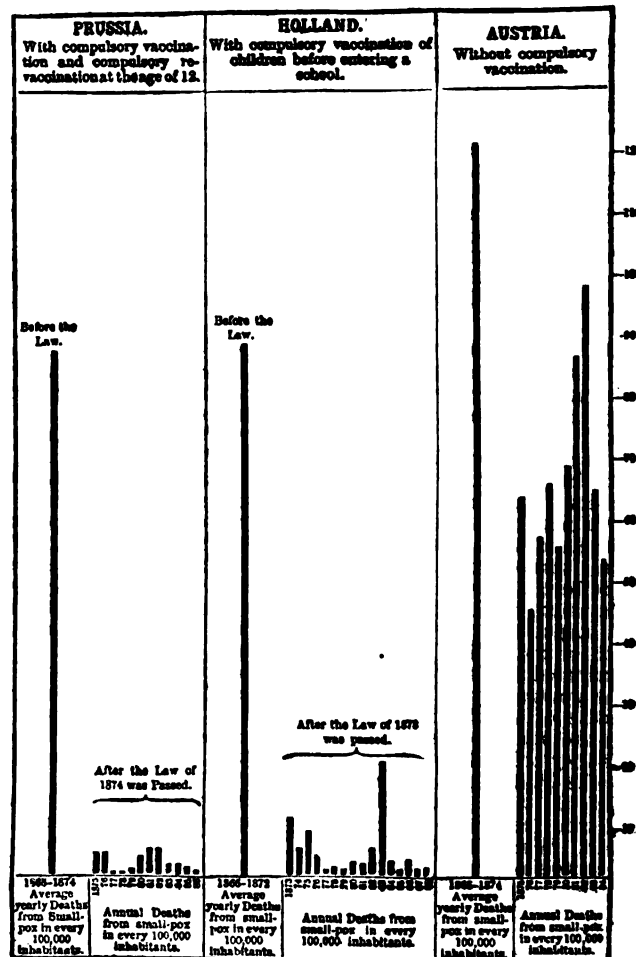
SIMPSON, WILLIAM, a member of the Royal Institute of Painters in Water Colors, died August 17, 1899. He was known especially as a war artist and correspondent. Born in Glasgow, October 28, 1823, he was educated in that city and at Perth, and studied art. In 1854-55 he was in the Crimean War as an artist, and on his return to England received the thanks of the Queen for his despatches and sketches. He passed three years sketching in India, saw the Indian mutiny, and visited Kashmir and Thibet. He was in the Abyssinian campaign, 1868; the Franco-Prussian War, 1870, and the war of the Commune in Paris, 1871. In the following year he went to Pekin to report and sketch events connected with the Emperor's marriage, and on his return he witnessed the Modoc Indian War in California. Simpson accompanied the Prince of Wales on the latter's visit to India in 1875-76, the next year he visited Mycenæ and the Troad in order to illustrate the explorations of Dr. Schliemann, and in 1878-79 he witnessed the Afghan War. He had attended the marriage of the late Czar Alexander III. at St. Petersburg, and in 1883 was present at his coronation in Moscow. In 1884-85 he accompanied General Sir Peter Lumsden and the Afghan Boundary Commission to the Afghan frontier in Central Asia. Besides various papers on archaeological and architectural subjects. Simpson published: *The Campaign in the East*, a series of views illustrating the Crimean War, dedicated to the Queen, 1855; *Meeting the Sun, a Journey Round the World*, 1873; *Picturesque People, or Groups from all Quarters of the Globe*, 1876; *Shikar and Tamasha*, commemorative of the visit of the Prince of Wales to India, 1876; *The Buddhist Praying Wheel*, 1896.

SIMSON, MARTIN EDUARD VON, German jurist, was born November 10, 1810; died May 2, 1899. From 1826 to 1829 he studied political science and jurisprudence at Königsberg; having subsequently studied at the universities at Berlin and Bonn and at the Paris Law School, he was made in 1831 a *privat docent* at Königsberg, and in 1836 became a professor in ordinary of Roman law. In 1846 he was appointed to the counsel of the tribunal in Königsberg. Two years later he was elected from this city to the Frankfort national assembly, of which in December, 1848, he became president; his executive duties were performed with great ability. As president he was the head of the delegation that on the 3d of April, 1849, announced to the King of Prussia his selection as German Emperor. The following month he left the national assembly, and in the summer gained prominence in the lower chamber as a speaker for the Constitutional party; in 1850 he was made president. He resumed his academic work in 1852. In 1859 he again entered the Prussian assembly, being its president in 1860-61. He was elected president of the first *Reichstag* of the North German Confederation in 1867, and two years later became president of the Court of Appeals at Frankfort-on-the-Oder. On account of his health he declined a re-election to the *Reichstag* presidency in 1874, and three years later retired from political life. He was appointed, however, the first president of the new imperial chamber at Leipsic in 1879. In March, 1888, Emperor Frederick III. conferred on him the honor (hereditary) of the order of the Black Eagle. Simson retired in 1892. He wrote *Geschichte des Königsberger Obertribunals*.

SKATING as a sport has flourished for many years in America, which has compared favorably with the old world in this branch of athletics. During the last decade the names of Donoghue, Mosier, Reynolds, Johnson, and others have been associated with many new records, the first-named skater having at one time held nearly all the records up to 100 miles, and distanced European skaters in a trip abroad. In Canada, McCulloch, Nilsson, Davidson, Rudd, and others have carried fame for the Dominion. In 1899 the National Skating Association held its races in this country under the metric distances which prevail abroad. These races resulted as follows: 500 metres (546.8 yards), E. A. Thomas, of Newburgh, 59 $\frac{3}{4}$ seconds; 1500 metres (1640.42 yards), E. A. Thomas, 3:06 $\frac{3}{4}$; 5000 metres (5468.1 yards), Charles McClave, New York City, 10:22 $\frac{3}{4}$; 10,000 metres (10,936.11 yards), Charles McClave, 21:36; figure skating, A. J. Keane, New York City, 62 points. In the Canadian Association races James Drury, of Montreal, won the half mile in 1:23, the mile in 2:50, 3 miles in 9:19 $\frac{1}{4}$, and 5 miles in 16:00 $\frac{1}{4}$. Michaelson, of Montreal, won the figure-skating event with 47 points. Abroad, P. Oestlund, of Trondjhem, skated 500 metres in 50 $\frac{1}{2}$ seconds for the world's championship, 1500 metres in 2:45, and 5000 metres in 9:54 $\frac{3}{4}$. J. C. Greve, of Amsterdam, won the 10,000-metre event in 20:36 $\frac{1}{4}$, and G. Hugel, of Vienna, the figure-skating championship, with 341 $\frac{3}{4}$ points.

SMALLPOX and VACCINATION. There were outbreaks of smallpox in a few localities in the United States during 1899, as well as in some of the newly acquired territory. In New Orleans, up to April 20, there had been 179 cases with but 3 deaths, 38 cases remaining under observation at that time. In Ohio, during March and April, an epidemic of considerable severity raged. For the year ending April, 1899, 1429 cases had been reported to the State Board of Health. Of these, 18 were fatal, showing a mortality of 1.26 per cent. Nearly 40 per cent. of the cases occurred in adults. Vaccination proved an almost absolute protection. From January to April 761 new cases were reported, with a mortality of 13, or 1.7 per cent. Cincinnati, Cleveland, and Columbus furnished 616 cases, with 10 deaths. In Illinois an epidemic spread throughout the State in October and November; accurate figures have not been published thus far. Measures were taken early by the United States Army to stamp out the smallpox in Puerto Rico. A vaccine farm was established with an output of 15,000 points a day. About 200 persons per day were vaccinated by each of the native practitioners employed for the purpose, 790,000 persons being vaccinated in three months, at a cost of \$32,000. Late in October it was reported to the government that the threatened epidemic was at an end, and that not a single case of smallpox was then known in the whole island. The anti-vaccinationists are again persistent and confident, in spite of the facts of history. In midsummer they pointed to the fact that smallpox was found among the American troops in the Philippines, stating the occurrence of 151 cases of variola (of which 77 were fatal), and 85 cases of varioloid (of which none were fatal) in a total of 30,000 men who they claim were "all well vaccinated." Inquiry into the facts reveals the truth. When the army was rapidly increased from 25,000 men to 280,000 men, vaccination was not rigidly enforced. In the Philippines, at the outbreak of the disease, a supply of vaccine was procured from San Francisco which proved inert, possibly from the voyage and from heat. A small supply was then procured from Japan, and later a good supply was prepared by the Board of Health in Manila. During the delay the disease made the progress noted. Since 1883 smallpox has

prevailed in some part of the country; yet, although epidemics have occurred near many of the army posts, only 20 cases have occurred (with a fatality of 4) in a mean strength of 25,000 men. The regiment which occupied the Holguin district of Cuba during the stamping out of the epidemic there (from which one in ten of the natives was dying), although constantly exposed to infection, did not report a single case. The statistics of smallpox in Massachusetts have been published in a summary compiled by Dr. S. W. Abbott, of the Massachusetts Board of Health. In the seventeenth and eighteenth centuries epidemics were of frequent occurrence with great mortality. In 1721 nearly 8 per cent. of the entire population of Boston died of smallpox. From 1800 to 1840, vaccination limited the disease so far that not over 20 deaths resulted from smallpox in that time. The relaxing of the vaccination law in 1836 led to a larger death rate in 1839 to 1841, when 232 died from smallpox in Boston. After that date registration laws were enforced furnishing accurate returns for the whole State, and from these we learn that deaths from smallpox from 1842 to 1855 were 1304 in number. No deaths were registered from this cause in 1886 or 1895. The Japanese government has made vaccination compulsory in Japan. All children must be vaccinated before reaching the age of 10 months, must be revaccinated at 6, and again at 12 years of age. No better contrast between the great mortality due to absence of compulsory vaccination laws, and the great protection offered by vaccination, can be shown than that afforded by the figures for Prussia, Holland, and Austria. The statistics show that the control or the eradication of the disease bears an exact proportion to the thoroughness of vaccination and revaccination. The *Melbourne Argus* shows very effectively the conditions in Prussia, Holland, and Austria in the subjoined table:



SMART, JOHN, Scotch landscape painter, died June 1, 1899. He was the son of Robert Campbell Smart, the engraver, and was born in Edinburgh, October 16, 1838. He was educated at the Leith High School, and received his first art education at the school of the Board of Manufactures. He was apprenticed to an engraver in 1853, but as he gave evidence of ability in landscape painting, he became in 1860 a pupil of Horatio McCulloch, R.S.A. He was made an associate of the Royal Scottish Academy in 1871, and was admitted to full membership in 1877. The following year the Royal Scottish Water Color Society was founded, Smart being one of the original members. He devoted himself chiefly to delineations of the highland scenery of Scotland. Among his finest works are "The First of Winter's Snows," exhibited at the Royal Scottish Academy in 1874, and "The Gloom of Glen Ogle," exhibited at the Centennial Exposition, at Philadelphia. His other best-known paintings are: "The Land of Macgregor;" "The Last Rest of the Clansmen;" "Shadow and Shower;" "A Dream of Strathearn." He published a series of etchings, "The Golf Links of Scotland," and another series entitled "Twenty of the Older Greens."

SMITH COLLEGE, at Northampton, Mass., began its work in 1875. The most important work accomplished by the faculty during the collegiate year ending June 20, 1899, was a thorough revision of the course of study, whereby wider options can be given to candidates in the requirements for admission, and only the one degree of A.B. can be conferred on the completion of the regular academic course. In order to give fair notice to the preparatory schools, however, the new scheme of study will not go into full operation until 1901. The college is a subscriber to the Classical School in Athens and the Classical School at Rome, in both of which schools its alumnæ have been represented, two of them having received the first fellowships given by the school at Athens to women students. A new college dwelling-house, called the Tyler House, after Professor William S. Tyler, was completed early in the year at a total cost of \$38,038, and two other houses were purchased, to be called respectively the Haven House and the Wesley House. The chemical laboratory was completed and occupied in February, 1899, the total cost being \$41,587. The \$50,000 promised for Seelye Hall on condition that the trustees would appropriate an equal amount, was duly paid into the college treasury, and the library endowment fund of \$20,000 was completed, and is to be known as the L. Clark Seelye Library Fund. The total gifts to the college during the year were \$128,288, a larger sum than in any previous year of its history. For statistics see UNIVERSITIES AND COLLEGES.

SMITH, WILLIAM HUGH, ex-Governor of Alabama, died in Birmingham, Ala., January 1, 1899. He was born in Georgia in 1826, but in boyhood moved with his father to Randolph County, Ala., which before the Civil War he represented in the legislature. He was a Republican and opposed secession. In 1868 he succeeded Governor Patton, serving two years. Both before his governorship and after he was circuit judge, and in 1881 was appointed by President Garfield district attorney for the northern district of Alabama, in which position he remained until the beginning of Mr. Cleveland's administration in 1885.

SMITHSONIAN INSTITUTION. See ANTHROPOLOGY IN AMERICA.

SOCIALISM. There has been a tendency among Socialists in recent years to modify their theories in some important respects and to assume a more compromising attitude toward other political parties. This tendency has offended some of the more strictly doctrinaire groups. It was especially marked in 1899, occasioning active discussion and divisions among parties. As representatives of this more practical and conciliatory spirit we may mention Herr Vollmar in Germany and M. Millerand in France. The former entered into an alliance with the Catholics of Bavaria and the latter took his seat in the Waldeck-Rousseau cabinet side by side with General de Galliffet, who had distinguished himself by his severity in the suppression of the Commune. The discussion of Millerand's action was carried on not only among the Socialist groups in France, but among the Social Democrats of Germany, Belgium, and Holland, since it involved the important question, How far may the Socialist proletariat interfere in the politics of the bourgeoisie in order to save public liberty, as, for example, in the case of the Dreyfus affair? In other words, to what degree is the idea of the conflict of classes opposed to a partial assumption of governmental power by the Socialist party? Radical leaders, like M.M. Guesde and Vaillant in France and Herr Liebknecht in Germany, held in general to the view that the sharing of power with the bourgeoisie was not permissible. As to the Dreyfus affair, they held that it had no revolutionary importance, and that Socialist interference in it was bad policy. Herr Bebel stigmatized it as a mistake and as bringing discord into the party. In France the majority of Socialists seemed to favor the Dreyfusard policy, but many of those who were consulted disapproved of Socialist participation in ministerial power. Along with this change in the attitude of men of affairs there has been an effort on the part of theorists to recast the Socialistic doctrine, and the best illustration of this is to be found in the work of Herr Bernstein, entitled *The Hypotheses*

of *Socialism and the Task of the Social Democracy* (Stuttgart, 1899), which was regarded by some as the most important Socialistic publication since the appearance of Karl Marx's great work, *Das Kapital*. The practical reason for a revision of the strict doctrines of Karl Marx was the need of adherents. By holding aloof from martial measures as likely to defer the revolution, the Socialists would have forfeited the support of the workingman. They have on the contrary interested themselves actively on his behalf, and labor reform has taken its place in their programme. Again, it would hardly do to preach strict Marxism to the agricultural laborer, who would not be likely to favor a party that told him he was on the eve of destruction, and that his little holding was sure to be absorbed under collective ownership. It is natural that these practical necessities should cause a modification of the theories. According to Bernstein, Marxism must be abandoned as a system. He criticised the surplus labor theory, and the idea that the entrepreneur derives his gain by robbing the workingman through a one-sided exploitation of the hours of labor. He objects to Marx's view as to the concentration of industry, and points out that such concentration does not apply to agriculture, and that it does not necessarily mean concentration of fortunes. And as to the prosperity of the working classes under the capitalistic system, Bernstein holds that the working classes are the most prosperous precisely in those countries where capitalism and the use of machinery have been carried to the farthest point. The Social Democracy, says he, is not the product of misery, but of the awakened conscience of a class that is bound to improve its condition. Like other recent writers on Socialism, he emphasizes the need of improving the moral character of the workingman, and advises the abandonment of revolutionary propaganda. He favors trades unions as a good means for carrying on this work of moral education. In other words, he would substitute a spirit of reform for the spirit of revolution, and would advise working classes to seek their emancipation by organizing themselves rather than by expropriating the bourgeoisie.

A Proposed Congress.—Early in the year it was planned to hold a great international Socialistic congress at Paris in 1900, and on March 7, 1899, a manifesto was addressed to all the Socialistic and labor organizations of the world proposing a preparatory conference at Brussels on May 27-28. Admission to this conference was conditioned upon a belief in the following principles: Socialization of the means of production and exchange; international unity of action among workingmen; conquest of political power by the proletariat organized as a class. The last-named feature of the programme was condemned by the radicals, who proposed a congress of their own, which should also meet in 1900. They disapproved of what they characterized as a mere political move. Thus the forces of the Socialists were divided as before into the parliamentary and the anti-parliamentary groups. The latter exist in Holland, Spain, and Belgium, as well as in France, but have not the importance of their adversaries, who are willing to adopt practical means for advancing their aims. The anti-parliamentary group generally manifest great confidence in the principle of a general strike. The preparatory conference was held at Brussels at the time appointed. Eleven nations were represented, and France sent the largest number of delegates. It laid down the conditions of admission to the proposed international congress of 1900. These were the same as had prevailed for the international congress of London. While excluding anarchists, the new congress was to include all Socialistic groups which aimed at the substitution of Socialistic ownership and production for capitalistic property and production, and favored parliamentary action as a means to that end; also all labor organizations which recognized the need of political and parliamentary action. The programme for discussion included the following topics: An international *entente*; international labor legislation; the emancipation of labor; the proletariat; the political and economic expropriation of the bourgeoisie; socialization of the means of production; international peace; militarism; suppression of permanent armies; colonial policy; maritime workingmen; universal suffrage and direct legislation; communal socialism; conquest of public powers; alliance with the parties of the bourgeoisie; trusts. The subject of a general strike was excluded by a vote of six nations against five. This showed the dividing line between the party of political action and the revolutionary groups.

Germany.—The anti-strike bill mentioned in the last YEAR BOOK as favored by the Emperor in view of certain disorders in the industrial world was still under discussion in 1899. At a congress of German labor organizations, held at Frankfurt on May 13 this bill was the subject of the greatest interest. It was vigorously opposed. A book attacking the measure was widely circulated, nearly a million and a half copies being published. (See GERMANY, paragraphs on History.) This measure was characterized by its enemies as an attack on workingmen's liberty of association. But the Saxon government aroused more resentment for its alleged infringement of workingmen's rights than the government of the empire. This was illustrated in 1899 by the affair of Löptau. A party of carpenters assaulted their employer after a quarrel in regard to the employment of certain workingmen overtime. The assailants,

having been arrested, received the maximum penalty. The Socialist newspaper *Vorwärts* started a subscription on behalf of their families, and appealed to public opinion against the severity of the sentence. In the *Reichstag*, a Socialistic deputy, Herr Heine, referred to the condemned as martyrs, and blamed the employer as the aggressor. The most important event in the year's record of German Socialism was the congress of German Socialists, at Hanover, October 8-14, 1899. It brought out very clearly the recent tendencies noted in a preceding paragraph. The great question was whether men like Vollmar, Auer, and David, who favored an opportunist policy, and a modification of the older doctrines, should prevail over the more radical party as represented by Bebel, Liebknecht, Kautsky, and others. After a lively discussion a compromise was reached in a resolution reaffirming the essential principles of Socialism, but making certain concessions to the new spirit, as, for example, the authorization of political alliances with the parties of the bourgeoisie in certain circumstances.

France.—After the suicide of Henry, the French Socialists showed a tendency to unite in their attitude toward the Dreyfus affair. They hailed it as an attack on existing institutions, and therefore likely to weaken the basis of society. But the entry of M. Millerand into the Waldeck-Rousseau cabinet destroyed all hope of union. Out of the 37 deputies in the chamber only 18 voted for the ministry, and the same division showed itself in the country at large. The opponents, led by MM. Guesde and Vaillant, condemned this policy of compromise and stood squarely upon a revolutionary platform. M. Jaurès defended Millerand's course. An attempt was made by the rival Socialist factions to restore harmony, and a new congress was proposed. The *Syndicat Guérard* with its programme for a general strike was conspicuous in 1899, as in the previous year. The attempt at a general strike toward the close of 1898 had failed, and the authors, including the committee of administration and the secretary-general, offered their resignation. At a special meeting of the syndicate on January 20-21, 1899, these resignations were accepted, but the officers were discharged from all blame. The failure of the movement in 1898 did not deter the radical members from renewing their demand for a general strike, and there was much discussion of the subject in 1899. Some suggested that the 1900 exposition would offer an excellent opportunity for such a movement.

Great Britain.—Early in March, 1899, a meeting of English, Belgian, French, and German Socialists was held at London to discuss the question of international peace, and proposed their own programme, in opposition to that of the Czar. International Socialism, according to them, was the only possible basis of international peace, since it alone could bring about the solidarity of the people and the spirit of brotherhood. Indiscriminate attacks were made upon the policy of the various governments. English generals were accused of killing wounded men and mutilating the dead, and classed with the French generals who had conspired against Dreyfus, and Russia's policy in Finland was said to be merely following the example which England had set in India. Capitalism and militarism in all their manifestations were the subjects of much denunciation. See TRADES UNIONS.

SOCIAL SCIENCE ASSOCIATION, AMERICAN, founded in 1865, was incorporated in 1899, and had in the latter year about 1000 members. General meeting for 1900 at Washington, May 7-11. President, Charles Dudley Warner; secretary, Frederick Stanley Root, 129 East Fifteenth Street, New York City.

SOCIALIST TRADE AND LABOR ALLIANCE was organized in 1895 by seceding members of the Knights of Labor. General meeting for 1900, at Pittsburg, Penn., September 17. The alliance publishes *The People*. Secretary, William L. Brower, 23 Duane Street, New York City.

SOCIETY ISLANDS, a group in the Pacific Ocean, constituting one of the French establishments, lie near longitude 170° west and latitude 16° south, and include Tahiti, Moorea, Meitia, and the Tetiaroa Islands. Tahiti, the largest, has an area of 412 square miles, and a population of about 10,300; the area of Moorea is 50 square miles, and the population about 1600. The establishment is administered by a governor, assisted by a council; besides there is a general council elected by popular vote. The principal town is Papeete on Tahiti. For 1898 the local budget was 1,229,625 francs; the revenues do not meet the expenditure, and the appropriation by France, budget of 1899, was 856,080 francs. There are under cultivation in Tahiti and Moorea about 7000 acres. The leading export is mother-of-pearl; other important exports are vanilla, copra, cotton, and oranges. The chief imports include provisions, textiles, wines, sugar, and timber. The imports come largely from the United States, from Great Britain and her colonies, and from France and her colonies. The imports and exports for 1898 were reported to amount to \$577,584 and \$570,490 respectively. In 1897 there entered at the port of Papeete 286 vessels, aggregating 29,585 tons.

SOCOTRA. See ZOOLOGICAL STATIONS.

SOLIDIFICATION OF HYDROGEN. See PHYSICS.

SOMALI COAST, a British protectorate extends along the Gulf of Aden from Obock, or the French Somali Coast Protectorate, to Italian Somaliland, and is bounded on the east and south by the latter, and also on the south by Abyssinia. The area is 68,000 square miles. No trustworthy estimate has been made of the population, which is Mohammedan and largely nomadic. The chief town is Berbera, with about 30,000 inhabitants; the population of Zaila is 6000, of Bulhar 5000. The protectorate is administered by a political agent and consul, and up to 1898 was attached to the Aden dependency of the Bombay presidency, but in that year it was placed under the British Foreign Office. The consul-general is Lieutenant-Colonel J. Haye Sadler. The products and exports are chiefly cattle, hides and skins, ostrich feathers, sheep, and gum. The principal imports are rice, dates, and textiles. It was reported in the fall of 1899 that Mohammed Saleh, an Arab mullah who had been proclaimed Mahdi by the Mussulmans of the hinterland, had incited a Mohammedan uprising, which was thought to be directed against Abyssinia. Indo-British troops were said to have reached the Somali coast and a battle taken place near Berbera.

SOMALILAND, an Italian dependency, extending along the Gulf of Aden and the Indian Ocean from the British Somali Protectorate to British East Africa, and bounded on the west by these two districts and by Abyssinia. This coast strip is 180 miles wide. The estimated area is 100,000 square miles, and population about 400,000. The seat of government is Itala, a newly formed settlement. On November 28, 1899, a convention with the Italian Trading Company, of Benadir, was approved, according to which the administration of both the towns and the hinterland was undertaken by the company.

SONS OF THE AMERICAN REVOLUTION, organized in New York in 1889 and chartered in Connecticut in 1892, had in 1899 a membership of 9690, in 38 State societies, of which those of New York (1100 members), Massachusetts (1300), and Connecticut (1000) are the most important. The officers of the New York or Empire State, Society are Robert B. Roosevelt, president; secretary, William W. Kenley, 1123 Broadway, New York. The officers of the national society are: President-general, Franklin Murphy, New Jersey; secretary-general, Samuel E. Gross, Chicago, Ill.

SONS OF THE REVOLUTION, a society first organized in New York in 1875, comprising only the male descendants over 21 years old, of a person who was a "military, naval, or marine officer, soldier or sailor, or official in the service of any one of the thirteen original colonies or States," between April 19, 1775, and the same day in 1783. The last triennial meeting was held at Denver, Col., April 19, 1899. The next is to be held in Washington, D. C., April 19, 1902. There are 30 State societies and one in the District of Columbia, with over 7000 members. General president, Ex-Governor John Lee Carroll, Maryland; general secretary, J. M. Montgomery, New York.

SONS OF VETERANS, U. S. A., a society of the lineal descendants of soldiers, sailors, and marines who fought in the Union army in 1861-65. The first camp was organized in Philadelphia, September 20, 1879. There are now about 2000 camps, divided into 29 divisions, each division being under a commander. Each camp has its own officers, the chief officer being a captain. The total membership is about 100,000. The nineteenth annual encampment will be held at Syracuse, N. Y., in September, 1900. Commander-in-chief, A. W. Jones, Youngstown, O.

SONS OF WAR VETERANS, SOCIETY OF THE, is composed of male lineal descendants of those who fought on the Union side in the war of 1861-65. Commander-in-chief, W. F. Langschultz, New York City; adjutant-general, W. F. Kennedy, 110 East Forty-seventh Street, New York City.

SOROSIS, the oldest society of women in the United States, founded in 1868, for political, literary, and social aims, had in 1899 a membership of 240. Secretary, Mrs. William Curtis Demorest, 68 East Sixty-sixth Street, New York City.

SOUDAN. See EGYPT.

SOUTH AUSTRALIA is a British colony, extending through the central portion of the continent of Australia, from the north to the south coast, is divided into the Northern Territory, added in 1863, and South Australia proper. The total area is 903,690 square miles. The greatest length north and south is 1850 miles and the extreme breadth, 650 miles, with a seaboard on the Indian and the Atlantic Ocean of about 2000 miles. The population, as estimated on December 31, 1898, was about 362,900. The population, as will be seen, is sparse; Adelaide, the capital of the colony, contains with its suburbs about 147,600, or about two-fifths of the inhabitants. At this city are the University of Adelaide, and a public library, museum, and art gallery. The northern territory, containing the town of Palmerston, situated on

a fine harbor, has less than 5000 of the total number of inhabitants in South Australia. The colony is divided also into three natural sections, characterized by climatic conditions. The southern and more settled portion is fertile, and is chiefly adapted to wheat growing; the middle portion is arid, and the northern part of the colony is subject to tropical rains. The climate in the south is said to be one of the best in Australia, and the soil almost matchless, but there is little rainfall. Irrigation, however, is being largely extended, the river Murray being the main source of supply. Although South Australia proper is the more settled portion of the colony, nearly 79 per cent. of its lands are said to be practically unknown and wholly uncultivated. Of the remaining 21 per cent., or about 51,546,880 acres, some 2,604,122 acres were under cultivation in 1898. Ninety per cent. of the cultivated lands was in cereal crops, chiefly wheat. The quantity of wheat produced in the colony in 1898-99 was 8,778,900 bushels. Among important products also are fruit and wine. There were in 1898 about 5,012,620 sheep, and 35,118,644 pounds of wool were exported. Mineral resources have not yet been developed to any great extent, but copper and gold, silver, lead, manganese, bismuth, iron, and coal are found. The exports for 1898 were £6,795,774 and the imports, £6,184,805. The revenue is derived mainly from customs duties, inland revenue, territorial receipts, posts, telegraphs, and railways. The public debt in 1898 was £24,408,535, one-half of which was represented by railways. The latter show an annual profit over working expenses of 3.3 per cent. The total length of government lines in 1898 was 1724 miles. There is a telegraph line 1975 miles in length, crossing the colony from ocean to ocean, between Adelaide and Palmerston, at Port Darwin, which was built by the colony in 1872; the wire is now being duplicated. There are nearly 6000 miles of additional lines. There is universal suffrage in South Australia. The government is administered by a governor, Lord Tennyson being appointed in 1899, and a parliament elected by the people, consisting of a legislative council and a house of assembly. The governor is commander-in-chief of the forces. The premier in 1899 was the Right Hon. C. C. Kingston.

History, 1899.—The Australian colonies do much by means of the government, and South Australia is among the first in this respect. Dr. John A. Cockburn, a former premier and for many years minister of education in this colony, described in an address before the International Commercial Congress in 1899 the sphere of governmental action in South Australia. The formation of homes is encouraged by selling the settler government land on such terms that he can invest most of his capital in the development of his property; efforts are made to settle labor by a system known as workingmen's blocks. Many laborers are demanded at harvest time, but there is very little work for these men during other times in the year. It is the purpose to settle these laborers on blocks of land, on which spare time may be employed during a dearth of employment, the state advancing sums of money for buildings and other improvements. Sometimes these blocks are combined to form village settlements, the workingmen holding their land, irrigation machinery, pumping plant, and means of production in common. There is also a government receiving depot, by the aid of which small fruit growers and the like are enabled to forward their produce for export at a minimum of expense, and to compete with the large dealers. Questions in dispute are, when important, generally referred to the people themselves for decision. Of course, the greatest question throughout Australia in 1899 was that of colonial federation. In South Australia the proposal was approved by a popular vote of 66,000 to 17,000. (For a full discussion of the subject see the article AUSTRALIAN FEDERATION.) Another important question submitted to popular vote was the bill lowering the franchise qualification for the council from £25 to a household franchise. This was passed by the assembly, but thrown out by the council; being then submitted to the people, it was passed. In October troops were offered to the imperial government for service in the South African war. The ministry resigned in November, owing to a want of support, and was succeeded by a cabinet formed by Mr. Solomon.

SOUTH CAROLINA, a southern Atlantic State, with an area of 30,570 square miles. Capital, Columbia.

Mineralogy.—Quarrying yielded a surprising result in 1898, when the output of granite, amounting in value to \$169,518, was an increase over that of the preceding year of \$131,698. There was also an increased production of limestone, the total value being \$34,000, making an aggregate value of \$203,518. The precious metals too indicated a larger activity, the production of gold being 5041 fine ounces, valued at \$104,200; and of silver, 300 fine ounces, coining value, \$388—in all, \$104,588.

Agriculture.—A noteworthy change appears to be taking place in the agricultural interests of this State, involving the supplanting of cotton by other crops, especially tobacco and wheat. In the season ending August 31, 1899, the cotton area was 2,353,213 acres and the production, 1,035,414 bales; and for the season ending August 31, 1900, the estimated area was 2,212,000 acres, and the estimated yield,

165 pounds of lint cotton to the acre. In 1899 the farmers planted tobacco extensively in six large counties in the rich Pee Dee section, and elsewhere many experimental farms were put under tobacco cultivation. Thousands of tobacco barns now dot the State, and in eight or ten towns large warehouses have been built. During August sales took place at these warehouses aggregating several million pounds of the leaf, at prices ranging from 4 to 26 cents per pound. Not only was the annual production about doubled, but the grade of leaf was greatly improved. It was believed that the warehouse sales of tobacco would amount to nearly 20,000,000 pounds for the entire season. The appreciation of wheat has been more sudden than that of tobacco. In 1898 a large acreage was planted in wheat, and while the oat crop failed, the yield of wheat was excellent. This result greatly stimulated planting, and also led to the building of about a score of roller mills in the early part of 1899, which, supplied with improved machinery, were kept rushing during the grinding season. State-grown wheat brought a higher price in the market than outside, and there was a local demand for the entire production. Another notable feature in local agriculture is the decided success of the tea gardens at Pinchurst, a suburb of Summerville, the only enterprise of its kind in the United States. This unique plantation belongs to Dr. Charles U. Shepard, who has devoted ten years to tea culture. In 1892 he had a crop of 56 pounds, in 1898 one of 1200 pounds, and in 1899 the crop was expected to reach nearly 4000 pounds, as the yield to August 18 was 2800 pounds. The plantation contains 800 vigorous plants and 200 young ones.

Manufactures.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$284,278. Eight manufactories of tobacco and 11 of cigars had a combined output in the calendar year 1898 of 659,532 cigars, 16,200 cigarettes, 2618 pounds of plug tobacco, and 6882 pounds of smoking. Grain and fruit distilleries in operation numbered 36; the amount of distilled spirits gauged was 219,975 gallons; and the production of fermented liquors, 7022 barrels. In his annual message to the legislature in January, 1900, Governor McSweeney, detailing the development of cotton manufacturing during 1899, declared that in this industry South Carolina leads all of the Southern States, and is second only to Massachusetts in the number of spindles. During the year 11 new mills were organized, representing a combined capital of \$3,275,000, and 16 old mills were remodelled, representing an increase in their capital stock of \$2,429,000. Few mills in the State have a capital of less than \$100,000, the majority have \$200,000, and one building in Columbia has \$1,500,000. All the mills paid good dividends in 1899, and an influential newspaper asserted that the easiest thing to do now in that part of the world was to raise \$500,000 with which to build a cotton mill. Including the one now building, Columbia alone has 6 mills, with \$4,500,000 capital, 6000 looms, and 250,000 spindles; and all but one of them are operated by electricity. The annual consumption of these mills is from 70,000 to 75,000 bales. In Spartanburg County there are 24 mills in operation, with \$5,110,000 capital, 12,454 looms, and 410,632 spindles, and their annual consumption is 220,000 bales. During 1899 the cotton mills of South Carolina consumed nearly one-third of the number of bales used in the factories of the Southern States. See COTTON AND THE COTTON INDUSTRY.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Beaufort and Charleston (\$997,879) aggregated in value \$1,050,004; exports at Beaufort and Charleston (\$8,059,158), \$8,999,292, making the total foreign trade of the year \$10,049,296, a decrease in a year of \$5,196,236, chiefly in exports.

Railways.—The new railway construction in the calendar year 1898 was 16 miles, and in 1899, 162.58 miles, giving the State a total mileage of 2818.03. Railway property was assessed at \$24,658,004 for taxation in 1898, an increase of \$515,663.

Banks.—On October 31, 1899, there were 16 national banks in operation and 6 in liquidation. The active capital aggregated \$1,923,000; circulation, \$662,009; deposits, \$5,533,358; reserve, \$1,541,220; and resources, \$10,375,188. The State banks, June 30, 1899, numbered 5, and had capital, \$251,925; deposits, 362,061; resources, \$799,869; and surplus and profits, \$94,391; and stock savings banks, 2, with capital, \$230,000; depositors, 3565; deposits, \$2,042,337; and resources, \$2,414,656.

Education.—There is no State school census. At the close of the school year 1897-98 the school population was estimated at 200,000 white and 350,000 colored, and the enrolment in the public schools was 125,102 white and 150,787 colored. There were 3076 teachers for white children and 2166 for colored, and the total expenditures were \$754,741, of which \$526,858 was for schools for white children. \$204,383 for those for colored, and \$23,500 for both in common. Public high schools numbered 85, and had 177 secondary teachers, 3312 secondary students, and 3550 elementary pupils; private secondary schools, 34, with 99 teachers, 1474 secondary students, and 2291 elementary pupils; and normal schools, 7 (1 public, 6 private), with 88 teachers and 1938 students in all departments. Normal training was also given in 5 colleges and 1 public and 4 private secondary schools. Nine universities and colleges for men and for both sexes reported 77 scholarships, 92 professors and

instructors, 1069 students, 71,300 volumes in the libraries, valued at \$93,000; \$22,300 invested in scientific apparatus, \$845,000 in grounds and buildings, and \$550,800 in productive funds; \$99,872 in total income, and \$31,514 in benefactions. Nine colleges for women reported 119 professors and instructors, 1423 students, 10,600 volumes in the libraries, \$404,000 invested in grounds and buildings, and \$123,200 in total income. The South Carolina Industrial Home for Negro Boys and Girls, an institution designed to do for colored children what the Tuskegee Normal and Industrial Institute does for grown negroes, was opened at Columbia on November 30, 1899, under the direction of Rev. Richard Carroll, a negro Baptist preacher. In 1899 there were 112 periodicals, of which 8 were dailies, 12 semi-weeklies, 95 weeklies, and 6 monthlies and quarterlies each.

Finances.—The assessed valuations for 1898 were: Real estate, \$100,719,716; personal property, \$47,859,385; and railroad property, \$24,658,004—total, \$173,237,105; tax rate, \$5 per \$1000. The total recognized bonded debt, January 1, 1899, was \$6,844,945, including \$350,208 in old bonds that have never been presented, and are probably destroyed. For many years the State derived considerable revenue from royalty on the phosphate mined in the deposits owned by it, but by 1898 this income fell to \$23,522.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 1,335,000.

Legislation.—The law giving the governor power to appoint police officers to enforce the Dispensary Liquor law was repealed. The use of the impression of the palmetto tree on bottles was prohibited. Officers who receive rebates or commissions are to be punished. Seats must be furnished for female employees, and the wages of discharged employees shall become due immediately. Fire insurance companies that combine to make rates of insurance are to have their licenses revoked. The State Board of Health is to enforce vaccination, and those who interfere or resist are to be punished by fine or imprisonment, "which shall not stand in lieu of vaccination." Corporations for transportation are to obtain charters from the secretary of state instead of by special act of the legislature. Charters of cities and towns may be amended by vote of the electors. Those who trade in sea-island cotton in the seed must have a license. It was made a misdemeanor for a cotton buyer to refuse to receive bales of cotton weighing over 300 pounds because of lightness, after purchasing by sample. Maximum charges were prescribed for handling and selling tobacco by warehousemen. Fertilizers must be inspected by the trustees of the Clemson Agricultural College. Although Governor Ellerbe, in his message at the opening of the general assembly, January 10, referred to the recent serious increase in the number of lynchings in the South, and strongly recommended legislation that should remedy the evil, no laws bearing upon the subject appear to have been passed.

State Officers and National Representatives.—Governor, M. B. McSweeney; lieutenant-governor, R. B. Scarborough; secretary of state, M. R. Cooper; treasurer, W. H. Timmerman; comptroller, D. P. Derham; attorney-general, G. D. Billinger; adjutant-general, J. W. Floyd; superintendent of education, J. J. McMahan. Supreme Court: Chief justice, Henry McIver; justices, Eugene B. Gary, Ira B. Jones, Y. J. Pope; clerk, U. R. Brooks. The State legislature consists of 164 Democrats and 1 Republican. Senators, Benjamin R. Tillman, from Trenton; and John L. McLaurin, from Bennettsville—both Democrats. Representatives, William Elliott, from Beaufort; W. J. Talbert, from Parksville; A. C. Latimer, from Belton; Stanyarne Wilson, from Spartanburg; D. E. Finley, from Yorkville; James Norton, from Mullins; and J. William Stokes, from Orangeburg—all Democrats.

SOUTH DAKOTA, a northwestern State, with an area of 77,650 square miles. Capital, Pierre.

Mineralogy.—The production of the precious metals in the calendar year 1898 was, gold, 275,723 fine ounces, valued at \$5,699,700; silver, 152,300 fine ounces, coining value, \$196,913—total value, \$5,896,613. According to the annual report of the State inspector of mines, the output of gold in the calendar year 1899 had a value of \$9,136,436. During that year 36 old mines in the Black Hills, which were formerly good producers of both gold and silver, were reopened, a movement growing out of improved business conditions, and the discovery of more economical methods of treating low-grade ores. In Laurence County alone 7 new cyanide plants were erected in the year, and 1,178,000 tons of ore were treated in the plants in the Black Hills and vicinity. Toward the close of the year a number of experienced Colorado mine operators began investigating the phonolite district of the Black Hills region. A number of valuable copper discoveries was made in the mining districts; wolfram ore was mined for the first time in the Hills, and prospecting showed the phonolite belt west of Deadwood to be 16 miles long by 4 miles wide. The American Mining Company began constructing a tunnel at the base of Ragged Top, on the quartz level in the Black Hills, which will be nearly a mile long, and cost approximately \$3,000,-

ooo. This company has laid out a town, named American City, and has planned to bring into use the power of Spearfish River, a short distance from the opening of the projected tunnel, and to create an electric power for all the cities and mining camps in the northern Black Hills. In November a rich streak of sylvanite ore was opened in Carbonate Camp, and the first regular shipment of copper ore from the Black Hills was made from the Blue Lead Mine, six miles east of Hill City. In the previous month a vein of nickel ore was discovered in Deadwood, the first of that metal found in the Black Hills region, and also a deposit of platinum; and an expert examination of the formations of the copper belt at Deadwood showed them to be practically identical with those of the great Butte camp in Montana. Altogether the year of 1899 was one of surprises, unusual activity, general prosperity, and rich promise.

Manufactures.—The two Dakotas are included in the internal revenue collection district of Nebraska, and the principal details of taxable manufactures are combined with those of that State. The collections in South Dakota alone aggregated \$172,707. Seven manufacturers of tobacco and 53 of cigars had a combined output in the calendar year 1898 of 4,767,973 cigars, and a small quantity of smoking tobacco. The State had about 150 creameries, whose production of butter exceeded \$3,000,000 in value.

Banks.—On October 31, 1899, there were 25 national banks in operation and 28 in liquidation. The active capital aggregated \$1,460,000; circulation, \$573,815; deposits, \$5,423,004, and reserve, \$1,838,665. The State and private banks, June 30, 1899, numbered 152, and had capital, \$1,964,530; deposits, \$7,327,356, and resources, \$10,208,324. The exchanges at the United States clearing house at Sioux Falls in the year ending September 30, 1899, aggregated \$6,771,245, an increase of \$1,022,967 in a year.

Railways.—The new railway construction in the calendar year 1898 was 12 miles, giving the State a total mileage of 2813.42. In 1899 the construction was principally confined to short feeders.

Education.—The latest reports on the public schools at time of writing were for 1895-96, when the estimated school population was 473,300 and the enrolment 258,183. For the school year 1897-98 there were reported 29 public high schools, with 68 secondary teachers, 1615 secondary students, and 278 elementary pupils; 7 private secondary schools, with 29 teachers, 370 secondary students, and 524 elementary pupils; 2 public normal schools, with 22 teachers and 593 students in all departments; and 1 private one, with 7 teachers and 120 students. Normal training was also given in 5 colleges. Six universities and colleges for men and for both sexes reported 40 scholarships, 76 professors and instructors, 947 students, 17,857 volumes in the libraries, \$6750 invested in scientific apparatus, \$390,500 in grounds and buildings, and \$82,500 in productive funds, \$62,215 in total income, and \$22,800 in benefactions. Two schools of technology had 24 professors and instructors, 421 students, 6400 volumes in the libraries, \$40,000 invested in scientific apparatus, and \$110,000 in grounds and buildings, and \$69,433 in total income. In 1899 there were 263 periodicals, of which 18 were dailies, 228 weeklies, and 14 monthlies.

Finances.—The assessed valuations for 1899, as equalized, aggregated \$158,722,704, an increase in a year of \$40,142,308, and the highest total in the history of the State. The total debt, January 1, 1899, all bonded, was \$738,300; sinking funds and other assets, \$226,430; net debt, \$511,869. There were also unpaid taxes more than sufficient in amount to pay the entire net debt. In 1898 railway property was assessed at \$9,328,053; other corporation property, \$311,761; and live stock, \$8,684,906.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 405,000.

Legislation.—An elaborate law was enacted regulating the manufacture and sale of food and providing against the adulteration thereof. A State board of embalmers was created to examine, register, and license all persons who embalm the dead, and to regulate the business. Registration of all voters is now required. Initiative and referendum will be applied to the State and to the municipalities, under laws passed in compliance with the constitutional amendment adopted by the people in 1898. At the same election the people voted that the manufacture and sale of liquor should be under exclusive State control, and be conducted by salaried agents of the State. At the general election of 1900 the question of the repeal of this article will be voted on, and also the question whether permanent school funds may be invested in mortgages on farm lands as well as State, county, school, and municipal bonds.

Elections.—In spite of the fact that there were no officers but Supreme Court justices to be elected, the election was the most animated one the State had had for years. The issue was the endorsement of the Republican administration, and on this line the battle was fought, the Republicans carrying the State by majorities approximating 5000.

State Officers and National Representatives.—Governor, Andrew E. Lee; lieutenant-governor, John T. Kean; secretary of State, W. H. Roddle; treasurer, John Schamber; auditor, James D. Reeves; attorney-general, John L. Pyle; superintendent of education, E. E. Collins. Supreme Court: Chief justice, Dighton Corson; justices, Dick Haney and H. G. Fuller; clerk, Miss Jessie Fuller. The State legislature consists of 87 Republicans and 45 Fusionists. Senators, Richard F. Pettigrew (Sil. Rep.), from Sioux Falls; and J. H. Kyle (Ind.), from Aberdeen. Representatives, Charles H. Burke, from Pierre; Robert J. Gamble, from Yankton—both Republicans.

SOUTHWORTH, MRS. EMMA DOROTHY ELIZA NEVITTE, author, was born in Washington, D. C., December 26, 1819, and died there June 30, 1899. She taught in a public school in Washington from 1844 to 1849, and during those years wrote her first story, *The Irish Refugees*; her first novel, *Retribution*, appeared serially in the *National Era*, and several others appeared serially in the *New York Ledger*. She wrote *The Irish Visitor*, *The Hidden Hand*, and 40 others prior to 1872, when a uniform edition of 42 stories was republished. She is said to have written 56 novels in all, dealing largely with Southern life. Among the best known are: *The Fatal Secret*; *Gloria*; *The Trail of the Serpent*; *The Bride's Fate*; *How He Won Her*; *The Mother-in-law*; *The Phantom Wedding*, and *The Hidden Hand*.

SPAIN,¹ a kingdom of Europe, occupying the greater portion of the Iberian peninsula, has an area, including 13 square miles on the coast of Africa, of 197,670 square miles and a population of about 18,000,000. The capital and largest city is Madrid, with a population in 1887 of 470,283. Other cities with a population of over 100,000 are Barcelona, Valencia, Seville, and Malaga. There are 17 cities having a population of over 30,000. The emigration from Spain is largely to Argentina, Brazil, and Uruguay. The latest figures are for 1895, when 166,269 persons emigrated.

Production and Commerce.—Spain is rich in minerals, especially iron, coal, copper, and lead. Mining has been neglected, considering the ore deposits at hand, but increasing interest in this branch of industry is said to have come about during 1897-99. Lack of railroad facilities has been one cause of retarded development, but lack of enterprise is the greatest. The most important agricultural products are wheat and other grains, hemp, flax, subtropical fruits, and products of the vine. It is said that, in spite of the recent war and the heavy taxation, native industries in Spain have not suffered as greatly as was feared. Efforts are being made to increase foreign trade and to find new markets to take the place of the colonies lost in 1898. The Spanish-American republics naturally offer the best inducements for the extension of Spanish trade, and commercial attachés have been appointed for Mexico, Brazil, Uruguay, Argentina, and Chile. Spanish imports into Cuba, Puerto Rico, and the Philippines are estimated to have exceeded \$40,000,000 a year. In respect to home affairs, it may be said that Spain is naturally a self-supporting country and to a large extent independent of foreign foodstuffs, there being quite a large amount of wheat exported in favorable years. In 1898, however, the price of wheat rose, Spanish currency depreciating at the same time, and import duties on wheat were suspended, and the export of cereals forbidden. Various disturbances and bread riots occurred, but the succeeding harvest proved a good one, and export of cereals was again permitted. Wheat imports, however, continued, about 109,000 tons being brought in during the first five months of 1899. The first direct shipment from the United States to Valencia after the war was a cargo of 4000 tons of red winter wheat. The United States consul at the latter port calls attention to the opportunities for Americans in this branch of trade. During March, 19,000 tons were imported, of which 7000 tons were American, 6000 Russian, and 4000 French wheat. In May the Russian imports were somewhat larger than those from the United States. Since the loss of her colonies Spain's sugar factories have been unable to supply the home demand, which amounts to about 100,000 tons of sugar during the year. There is a protective tariff of 102¼ per cent. on foreign sugar imports. Merchants and trades unions have petitioned that this duty be reduced to 50 per cent., and it is stated by our consul at Valencia that, in spite of the opposition of Spanish refiners, the duty will probably be lowered. He mentions this as another opportunity for American trade. Complete trade statistics for 1899 are not available. In 1898 the imports amounted to \$25,701,817 pesetas, the principal items being grain, sugar, wine, etc.; raw and manufactured cotton; gold and silver; minerals, glassware, and pottery, and drugs and chemicals. The principal importers were the Spanish colonies, France, and Great Britain, which also took the bulk of the exports. The latter amounted in 1898 to 838,617,599 pesetas, and included grain, sugar, wines, etc.; minerals, glassware, etc.; metals and their manufactures, animals and animal products, etc. In 1899 United States imports into Spain were \$11,528,777, a gain of over a million dollars. Spain exported to this country \$5,341,636, an increase of nearly \$2,000,000.

Army and Navy.—The regular army has a peace footing of 128,559 and a war footing of 183,972. Besides the permanent army, there is an active and a sedentary

reserve. There is also a colonial army, a large portion of which returned to Spain during 1898-99. Spain's navy is now under reconstruction. In 1898, in anticipation of war with the United States, Spain made some effort to modernize some of her older ships, such as the *Numancia*, *Vitoria*, and *Pelayo*. She lost in that war 45 large and small vessels in all (including 12 cruisers), with a total displacement of 48,042 tons. The most important armored vessels of the remaining Spanish fleet are the *Carlos V.*, *Pelayo*, *Numancia*, *Cataluña*, *Cisneros*, and *P. de Asturias*, the first two averaging 9500 tons and the remainder 7000 tons each; there are also 3 partially protected vessels of 5000 tons each and 1 of 1000 tons. Two cruisers were building in 1899—the *Isabel la Católica* and *Reina Regenta*. During the year the *Rio de la Plata*, of 1800 tons, was launched.

Finance, etc.—The budget estimates for 1898-99 were 937,930,415 pesetas for revenue and 937,178,134 pesetas for expenditure. In 1898 provision for extraordinary expenditures was made by credits on the Tobacco Company's advance, a loan on guarantee of the Almaden mines, and a tax on traffic, the operations extending to the close of 1904. The public debt at the beginning of 1898 was equivalent to £369,645,700, of which £57,655,000 represented the Cuban debt. The programme of the Silvela ministry in 1899 called for the recognition of the Cuban debt, but it was hinted that the taxation of the holders might be necessary. Seven-eighths of this debt were held in Spain.

HISTORY.

The Treaty of Peace.—The peace treaty between Spain and the United States, signed in Paris on December 10, 1898, was humiliating to the Spanish people, and certain clauses of it were signed under protest by the Spanish commissioners. Differences of opinion arose between the two commissions in their interpretations of the protocol of August 12, 1898, but the Spaniards were forced to acquiesce. They protested in vain against the relinquishment of Spanish sureties in Cuba and Puerto Rico, against the status of such Spaniards as desired to remain in the former island, and against the cession of the Philippines. It was deemed necessary to introduce in the Cortes, which had convened on February 20, a bill for the cession of these islands, and it was passed in the senate by a very narrow majority. The treaty was ratified by the United States Senate by a vote of 57 to 27 on February 6, 1899, and by the Queen Regent of Spain on March 17.

Cabinet Changes.—The government majority in the Cortes had decreased so considerably, as was shown by the vote on the bill for Philippine cession, that on March 1 the Liberal cabinet of Señor Sagasta resigned. The Queen Regent selected Señor F. Silvela, a Conservative, as the new premier, and on the 4th of the month he formed a cabinet, with General C. Polavieja as minister for war, Señor R. Fernandez Villaverde for finance, Señor J. Gomez Imaz for marine, Señor E. Dato for the interior, Señor M. Duran y Bas for justice, Marquis de Pidal for fomento. The ministry for the colonies was abolished, and that of foreign affairs was assumed by the president of the council. The new cabinet was received with marks of sympathy, but there were soon evidences of a want of harmony between Silvela and Polavieja. The policy of the Conservatives was said to have two essential features—regionalism and clericalism. Polavieja attempted to take far-reaching measures for the reorganization of the army and navy and the improvement of coast defences. The expenses that would thus be incurred met the disapproval not only of the public, but of the majority of Polavieja's colleagues in the cabinet. The disagreement led to his replacement on September 30 by General Azcarraga, who had been president of the council for some months succeeding the assassination of Señor Canovas. In October, 1899, another cabinet difficulty arose out of the troubles in Catalonia, a Basque province, that demanded a certain degree of local self-government. When the government refused to grant the demand of Catalonia, that province assumed a revolutionary attitude, and refused to pay the imposts. Serious troubles followed, and on October 27 a state of siege was proclaimed, and the imposts were collected under threats of military coercion. The minister of justice, Señor Duran y Bas, a Catalanian, had strong regionalistic leanings, and the attitude of the rest of the cabinet brought about his resignation on October 23. He was succeeded by Count Torrealanaz, director of the Bank of Spain.

The Cortes.—The Cortes began its session on February 20, 1899, and its members were soon involved in a violent discussion of the responsibility for the Spanish-American war. In the chamber the Sagasta government was attacked on the ground that it was the chief author of national disaster. In the senate, on the other hand, it was the military and naval leaders who had taken part in the war that became the objects of the most violent attacks, Count de las Almenas denouncing them in a speech that lasted several days. The leaders themselves demanded on February 27 the nomination of a parliamentary commission to inquire into their conduct, and the senate approved this measure by a vote of 130 to 7. On March 6 the Cortes was

prorogued, the government having decided upon a new election. The elections for the chamber of deputies were held on April 16, and resulted as follows: 243 Ministerialists (of whom 180 were followers of Silvela, 33 of Polavieja, and 30 the ultramontane followers of Pidal), 18 Conservative dissidents, or supporters of the Duke of Tetuan; 86 Liberals, 30 Liberal dissidents, 15 Republicans, 5 supporters of Romero Robledo, and 4 Carlists. On April 30 the senatorial elections resulted as follows: 110 ministerial Conservatives, 50 Liberals, 7 Liberal dissidents, 6 Conservative dissidents, 3 Carlists, 1 Republican, 1 Independent, 1 Integrist. The new Cortes convened on June 2. In the address from the throne on this day it was said that the most urgent and difficult task of the government was the settlement of the financial obligations resulting from the war, in view of which governmental economy was promised. But increased taxes, weighing especially upon the poorer classes, and the proposals of General Polavieja for increased army appropriations caused much popular discontent, which culminated on June 26 in serious demonstrations, started in part by the chamber of commerce. On this day nearly all the shops in Madrid and in various other cities were closed, and some serious disturbances occurred. At Saragossa there was an actual riot, in which several were killed and others wounded, and the city for a time was in a state of siege. Premier Silvela recognized the gravity of the situation, but let it be understood that the government would not give way under threat.

The Sale of the Pacific Archipelagoes.—On February 12 Spain signed a treaty with Germany, transferring to that power the three archipelagoes of the Carolines, the Ladrões, or Mariannes, and the Pelews, the remnants of the Spanish colonial empire in the Pacific. The announcement of the sale was made in the address from the throne to the Spanish Cortes on June 2, when it was said that it was no longer profitable for Spain to keep these relics of her former empire. The terms of the sale were as follows: Germany was to pay Spain an indemnity of 25,000,000 pesetas; to accord the commercial and agricultural interests of the Spanish in the islands the same privileges that were allowed to the German interests; to protect the Spanish religious orders, and to allow Spain to establish a coaling station in each of the three archipelagoes. From the Spanish point of view, the loss of the islands was not serious, since they no longer were of any use to Spain, and might some day call for further sacrifices, in order to defend them. The sum of 25,000,000 pesetas in the existing state of the Spanish finances was, moreover, no slight gain.

Catholic Congress at Burgos.—From August 30 to September 4, 1899, the fifth Catholic congress was in session at Burgos. The character of this congress had a political even more than a religious significance. It was evident that certain members of the congress were supporters of the Carlists, notwithstanding contrary instructions from Rome. To many disinterested observers the interests of peace seemed to require that the Pope's recommendations be followed, but many also who had no sympathy with the tendencies of the Carlist Clericals could not but approve their unwillingness to accept instructions from Rome in political matters. The congress denounced Liberalism, and set forth a programme for Catholic union, looking toward greater powers and privileges for the Catholic clergy, the prohibition of non-Catholic associations, the restriction of religious toleration to the narrowest limits permitted by the constitution, and various other stringent measures favorable to the Church. To carry out their programme the prelates asked the material support of the government. The replies of the Queen Regent and Premier Silvela, however, while friendly in tone, made it clear that they could not go as far as the episcopate desired.

SPANISH-AMERICAN WAR, NATIONAL SOCIETY OF THE, a patriotic society, founded in 1898, eligibility for membership consisting in loyalty to the United States. Honorary president, Clara Barton; honorary vice-presidents, Admiral George Dewey, Mrs. John A. Logan, Rear-Admiral W. S. Schley, and Major-General N. A. Miles; national executive secretary, Hildegarde H. Langsdorff, M.D., Carlisle, Penn.

SPECIES. See ZOOLOGICAL LITERATURE (paragraph Systematic Zoology).

SPECIFIC HEAT OF WATER. See PHYSICS.

SPECTROSCOPE OF FIXED DEVIATION. See PHYSICS.

SPIRITUALISM. See SPIRITUALISTS; PSYCHICAL RESEARCH.

SPIRITUALISTS, those who believe in spiritualism or the independent existence and activity of the soul apart from the body. In America, the National Spiritualists' Association, formed in 1893, with the purpose of organizing the various spiritualist societies in the United States and Canada, comprised in 1899, 16 State associations, 650 local associations, and 52 camp-meeting associations. The membership in these associations is placed at 150,000, while the number of spiritualists in the United States and Canada is said to be ten times that number. There are said to be 1500 professional psychics. There are 82 churches, or auditoriums, and property valued

at \$1,250,000. Ten periodicals are published. Secretary, Mrs. Mary T. Longley, 600 Pennsylvania Avenue, Washington, D. C. The eighth annual convention is to be at Cleveland, O., in October, 1900. In England the London Spiritualist Alliance, Limited, founded 1884, has local organizations in many British cities and towns, and publishes the periodical *Light* at the general offices, 110 St. Martin's Lane, W. C., London. President and editor of *Light*, E. Dawson Rogers.

SPORTS IN THE UNITED STATES. The year 1899 was marked by a general advance in the condition and practice of sports in this country. Progress has been especially notable along the lines of a healthy growth of the amateur spirit in most branches of sport and by the increased attention, both active and passive, which is being given to the subject of recreation by men of affairs as well as by the younger generation. The increasing number of college and athletic club contests is bringing an annually growing number of the latter class under healthful influences, and tennis, wheeling, and golf have been responsible for the more general introduction of women to outdoor life, a class which is gradually taking up many other branches of sport. Besides these influences of athletics on the national life, the year 1899 has afforded some brilliant individual performances in the various branches. These games are described under their proper heads. The subjects treated include athletics, field and track; baseball, boxing, bowling, cricket, croquet, curling, cycling, fencing, football, golf, ice-hockey, ice-yachting, lacrosse, polo, rowing, racquets, shooting, skating, swimming, tennis, water polo, wrestling, and yachting. See also the articles on billiards, pool, chess, and whist. International athletics are described in the following article.

SPORTS, INTERNATIONAL. In the matter of international contests the year 1899 has been an unusually interesting one, having been equalled by no other single season in the number of events contested. The more important of these were British-American, but the Canadian contests of 1899 were also above the average in a number of cases. A brief description of the principal events follows.

Contests with Great Britain.—The most important contests with Great Britain in 1899 include the yacht races for the America's Cup, the dual track and field games between Oxford-Cambridge and Harvard-Yale teams, and the cricket matches played in this country by a team of English experts, captained by the East-Indian Prince Ranjitsinhji, the most noted amateur cricketer of the day. The America's Cup races were marked by evidences of unusually good feeling on both sides, in marked contrast to the races of 1895. For a full account the reader is referred to the article **YACHTING**. The meeting between the English and American universities took place on July 22 at London. The result was a victory for the Oxford-Cambridge team, which won the meet with 5 firsts and 5 seconds, to 4 firsts and 4 seconds, scored by the Harvard-Yale representatives. The points were made in the following excellent performances, carried off under the most friendly and satisfactory conditions: 100-yards run, 10 seconds, R. J. Quinlan, Harvard; 440-yards run, 49¾ seconds, Cambridge; ½-mile run, 1:57½, Cambridge; 1-mile run, 4:24, Cambridge; 3-mile run, 15:24¾, Cambridge; 120-yards hurdles, 15¾ seconds, F. B. Fox, Harvard; running high jump, 6 feet, A. N. Rice, Harvard; running broad jump, 23 feet, Oxford; throwing 16-pound hammer, 136:08½, W. A. Boal, Harvard. It was hoped toward the close of 1899 that Oxford and Cambridge might come to America in 1900 to play a return game with a Yale-Harvard team. The third international event of importance, the visit of the all-English cricket team, headed by Prince Ranjitsinhji, resulted in a series of five games played in this country, besides one in Canada. Contests at Philadelphia, September 25 to October 2 and October 7-10, against prominent clubs of Philadelphia, the home of American cricket, resulted in 2 won games and 1 drawn game for the visitors; a game at New York was drawn, and in Canada the Englishmen won. The New York game was a virtual victory for the visitors, with an inning to spare. Among other athletic matters of an international color were the brilliant victories of Clarence Hobart in British and continental tennis, and the second consecutive victory of B. H. Howell, an American student at Cambridge, in the contest for the diamond sculls at Henley.

Contests with Canada.—Contests between Canadian and American athletes and sportsmen are annually becoming more frequent. Among the large number of events fought out in 1899 were yachting, including three different regattas; golf, tennis, cricket, racquets, ice-yachting, curling, and ice-hockey. The Americans won in golf, cricket, tennis, ice-hockey, and the Canada's Cup yacht races. The Canadians won in yachting (two regattas), in ice-yachting, and in curling, and also two events at the annual regatta of the National Rowing Association at Boston. In racquets the honors were divided. In the latter sport Rolland, the champion Canadian racquet player, was defeated by Clarence Mackay, but later in the Canadian championships at Montreal he defeated Quincy Shaw, who had won the American national tournament. In golf, a great victory was scored for the Americans. In

the previous year they had defeated the Canadians at Toronto by a score of 27 to 7. But in 1899, at the Morris Country Club, New Jersey, the Americans won by an aggregate score of 99 won holes to not one for Canada. The annual cricket match with Canada, played at Toronto, August 7 and 8, was one of the closest and most interesting played in years, and was won by the United States (representatives of Harvard, Pennsylvania, and Haverford) by 34 runs. The scores were: United States, 206 and 219; Canada, 222 and 169. In tennis the Americans invaded Canada with their usual success. M. D. Whitman won the Canadian championship. The Gordon medal for curlers was won at Montreal by Canadian players on February 24. A Canadian team won the Walker trophy at St. Paul, January 19.

The most interesting of the yacht races were those for the international inter-lake yacht trophy, the Canada's Cup, which took place at Toronto. On August 22, attended by a large fleet of vessels from all parts of the Great Lakes, the challenging yacht *Genesee*, of the Chicago Yacht Club, defeated the Canadian defender *Beaver*, of the Royal Canadian Yacht Club, over a 21-mile triangular course, the elapsed times being 3.25:09 and 3.26:32. Second race, 9 miles to windward and return, *Genesee*, 5.06:57; *Beaver*, 5.07:36; third, 21-mile triangle, *Genesee*, 3.32:11; *Beaver*, 3.42:58. The Seawanhaka-Corinthian Yacht Club's international trophy for half-raters, won three years before and since retained by the Royal St. Lawrence club, was raced for by these clubs at Montreal, 12-mile course, July 28 to August 3. The American boat *Constance* won the first two races, respectively, in 2.18:28 by 2¼ minutes, and in 2.04:00 by about 1 minute; the next two races were won by the Canadian boat *Glencairn III.* in 2.28:26 by about 3 minutes, and in 2.20:43 by 5¾ minutes. In the fifth and deciding race the Seawanhaka club objected to the course as laid out. It was changed, and then the *Constance* grounded. Her protest was not allowed, and the cup remained in Canada. The odd-numbered races were to windward over the course and return, and the even-numbered races were over a triangular course. In February, 1899, the Canadian yacht *Dominion*, which had won the Seawanhaka-Corinthian trophy in 1898, was challenged to a race by the White Bear Yacht Club of St. Paul. The *Dominion* defeated the *Yankee* in three out of four races, and won the special cup offered as a trophy.

STAAL, GEORGES, BARON DE, president of the peace conference at The Hague, is a Russian diplomat about seventy-five years old. The early part of his career was military, and in 1845 he entered the diplomatic service. Thereafter he represented Russia in Turkey, Greece, some of the German states, and finally in Great Britain, his present post, where he has endeavored to foster friendly relations between the rival nations. In May, 1871, he was made minister at Stuttgart. On July 1, 1884, he became ambassador at London. After the death of Nikolai K. von Giers, in January, 1895, he declined an appointment to the portfolio of foreign affairs in the Russian ministry. Baron de Staal represented Russia at the peace conference at The Hague, and on the opening day, May 18, 1899, was elected its president.

STARS, CATALOGUE OF. See ASTRONOMICAL PROGRESS.

STARS, DARK. See ASTRONOMICAL PROGRESS.

STATISTICAL ASSOCIATION, AMERICAN, founded in 1839, had in 1899 a membership of 519. The association holds quarterly meetings in Boston, and publishes quarterly *Transactions*. President, Hon. Carroll D. Wright; secretary, Dr. Davis R. Dewey, 491 Boylston Street, Boston, Mass.

STEEVENS, GEORGE WARRINGTON, author, was born December 10, 1869; he was connected editorially with the *Pall Mall Gazette*, in 1893, and with the *Daily Mail* in 1897. Publications: *Naval Policy and Monologues of the Dead*, 1896; *The Land of the Dollar and With the Conquering Turk*, 1897; *Egypt in 1898* and *With Kitchener to Khartum*, 1898; *In India and The Tragedy of Dreyfus*, 1899.

STEINTHAL, HEYMAN, a German philologist and philosopher, died March 14, 1899. He was born at Gröbzig, Anhalt, May 16, 1823. In 1843 he took up the study of philology and philosophy at the University of Berlin; here in 1850 he was appointed lecturer, his subjects being mythology and the science of language. From 1852 to 1855 he pursued a course of philological and literary studies in Paris. In 1863 he became professor of general philology at Berlin, and in 1872 lectured also on Judaism, the philosophy of religion, and the history of religion; thereafter he retained both of these positions. Among his many works are: *Klassifikation der Sprachen*, 1850, which work appeared later with the title, *Charakteristik der hauptsächlichsten Typen des Sprachbaues*; *Der Ursprung der Sprache im Zusammenhang mit den letzten Fragen alles Wissens*, 1851; *Die Entwicklung der Schrift*, 1852; *Grammatik, Logik, Psychologie, ihre Prinzipien und ihr Verhältnis zu einander*, 1855; *Geschichte der Sprachwissenschaft bei den Griechen und Römern*, 1863; *Abriss der Sprachwissenschaft*, 1871; *Allgemeine Ethik*, 1885; *Zu Bibel und Religionsphilosophie: Vorträge und Abhandlungen*, 1890. With Lazarus he edited *Zeitschrift für Völkerpsychologie und Sprachwissenschaft*, 1860-90.

STEYN, MARTINUS THEUNIS, president of the Orange Free State, was born at Winburg in that country October 2, 1857. He was educated at Grey College, Bloemfontein; Wevente, Holland; and at the Inner Temple, London, where, on November 17, 1882, he was called to the bar. He practised as an advocate at Bloemfontein from 1883 to 1889, when he was appointed state attorney, and a few months later second puisne judge. In 1893 he was made first puisne judge. Since March 4, 1896, he has been president of the State, and during his administration closer relations have been established with the Transvaal government. In 1897 the two republics formed a defensive alliance, agreeing to stand together in case either should be attacked. At President Steyn's invitation President Kruger and Sir Alfred Milner, high commissioner of South Africa, conferred at Bloemfontein in May, 1899, with reference to the points at issue between the Transvaal and Great Britain. When negotiations between these two governments came to an end in October, 1899, and war broke out, President Steyn's forces were immediately mobilized and took part in the conflict.

STILLÉ, CHARLES JANEWAY, LL.D., sometime provost of the University of Pennsylvania, died August 11, 1899. He was born in Philadelphia, September 23, 1819, and was educated at Yale, being graduated there in 1839. He studied law, but after his admission to the bar devoted himself to literary pursuits until the Civil War. During the war he served on the United States Sanitary Commission, being a member of the executive committee. In 1866 he was called to the chair of history in the University of Pennsylvania, and two years later was made provost. This position he held until 1880, and was succeeded in the following year by Dr. William Pepper, who died in July, 1898. It was during Dr. Stillé's administration that the university was moved to its present site in West Philadelphia. It is said that largely through his efforts began that growth of the university that was so marked in Dr. Pepper's time. Dr. Stillé was president of the Historical Society of Pennsylvania. He was the brother of Moreton Stillé, author of a treatise on medical jurisprudence, and of Alfred Stillé, professor emeritus of medicine in the University of Pennsylvania. He wrote: *How a Free People Conduct a Long War*, 1862; *Northern Interest and Southern Independence*, 1863; *The Historical Development of American Civilization*, 1863; *Memorial of the Philadelphia Central Fair for the United States Sanitary Commission*; *History of the United States Sanitary Commission*, 1866; *Studies in Mediæval Civilization*; *Studies in Mediæval History*, 1880; *Baumarchais and the Lost Million*; *General Anthony Wayne and the Pennsylvania Line: Life and Times of John Dickinson*.

STORER, BELLAMY, American lawyer and diplomat, was transferred by President McKinley on April 11, 1899, from the embassy at Brussels to the post of minister to Spain, which had been vacant since the departure from Madrid of Minister General Stewart L. Woodford at the outbreak of the war in 1898. Mr. Storer was born in Cincinnati, O., August 28, 1847. After graduation at Harvard in 1867, he entered the Cincinnati Law School, was graduated in 1869, and, being admitted to the bar, began practice in Cincinnati. He was elected, as a Republican, to the Fifty-second and Fifty-third Congresses, serving from 1891 to 1895. From 1897 to the time of his appointment at Madrid Mr. Storer was minister to Belgium. He was succeeded at Brussels by Mr. Lawrence Townsend.

STRAFFORD, Fourth Earl, Sir HENRY WILLIAM JOHN BYNG, K.C.V.O., C.B., was killed by a train at Potter's Bar, Middlesex, May 16, 1899. He was born August 21, 1831; was educated at Eton. He was page of honor to the Queen, 1840-47, and groom-in-waiting, 1872-74; in 1863 he retired from the lieutenant-colonelcy of the Coldstream Guards. He succeeded to the title upon the death of his elder brother, George Henry Charles, which occurred March 28, 1898, and was succeeded by his younger brother, the Rev. Francis Byng.

STRAITS SETTLEMENTS comprise British territory situated on the west coast of the Malay Peninsula and certain adjacent islands. They include on the mainland Provinces Wellesley and Malacca, and the islands of Penang, or Prince of Wales, Singapore, and the Dindings. Included in the administration are the Cocos or Keeling Islands, and Christmas Island, which lie southwest of Java, exclusive of which the colony has an area of 1475 square miles, and an estimated population in 1899 of 580,563. Besides these there are certain Malay states under British protection. It is one of the most important of the British crown colonies. The city and capital, Singapore, with a population of 185,000, is one of the chief commercial cities of the East, with a good harbor, and is a British military and naval station. In point of shipping it is said to be one of the greatest ports in the world. It is a port of call for trade between Europe, Australia, the Dutch Indies, India, and the East, and the tonnage of foreign clearances in 1898 was 8,287,184, or 9717 vessels. The total tonnage for the whole colony was 12,661,442, the other ports being Penang and Malacca. Nine important lines connect Singapore with Europe and the Far East, the companies being British, German, French, Italian, Austrian, Spanish, and

French. It is announced that an American line will soon connect Singapore with the Philippines. Six regular lines connect Singapore with adjacent states and colonies, and there are coastwise and river lines. There is cable connection with the important oceanic cables. There are no railroads in the colony, though there is a complete system of macadamized roads, and no navigable canals. At Penang there is a street railroad ten miles long. The imports in 1898 were \$248,110,547, principally rice and cotton-piece goods; also opium, fish, coal, tobacco, and petroleum. The exports were \$212,308,029, the chief item being tin, others being spices, gambier, gums, tapioca and sago, rattans, and copra. The articles mentioned include the products and purchases of the colony proper. There is a very large transit trade in many other articles, and this trade will account for the large figures given above. The standard coin is the silver Mexican dollar, and as this was worth about \$0.48 United States currency in 1899 the values given may be reduced about one-half. The estimated share of the United States in this trade in 1898 was \$19,587,640 in exports, and \$2,857,868 in imports, Mexican currency. The principal industry is that in tin, and the tin-smelting works are said to be the largest in the world. It is stated that the yearly consumption of ore, which is mostly native, is nearly 65,000,000 pounds, and the output nearly 45,000,000 pounds of metal. There are other important concerns also, such as the ice manufactory, with a production of 70 British tons daily, and the canning works, which turn out 125,000 cases of preserved pineapples per season.

STRAUSS, JOHANN, son of the prominent musician of the same name, was born in Vienna, October 25, 1825; died there June 3, 1899. After his father's death he took charge of the latter's orchestra, with which he toured, gaining fame, especially through his dance music. Among these pieces may be mentioned *An der schönen blauen Donau*, *Künstlerleben*, *Wiener Blut*. He organized an orchestra that played successfully in the principal European cities, and in 1872 he came to America to conduct an orchestra of 1000 performers at the Boston Peace Jubilee. At one time he was music director to the Emperor at Vienna. In that city in October, 1894, the fiftieth anniversary of his debut as a conductor was celebrated. Besides his famous waltzes he was well known for his operettas. Among the latter are: *Indigo*, 1871; *Die Fledermaus*, 1874; *Cagliostro*, 1875; *La Tsigane*, 1877; *Prinz Methusalem*, 1877; *Das Spitzentuch der Königin*, 1881; *Der lustige Krieg*, 1881; *Eine Nacht in Venedig*, 1883; *Der Zigeunerbaron*, 1885; *Simplicius*, 1887; *Ritter Pasman*, 1892. His younger brothers, Josef and Eduard, gained a wide reputation for their compositions in dance music.

STREET CLEANING, or sweeping, is done by hand in 18 cities, by machine in 17 cities, and by both methods in 72 cities, according to figures in *Statistics of Cities*, Bulletin 24, United States Department of Labor, September, 1899. These cities together aggregate 107 of the 140 cities of 30,000 population and upward included in the bulletin. For Covington, Ky., and Tacoma, Wash., it is reported that the streets are flushed, not swept, and for Spokane, Wash., that 33,975 square yards are flushed weekly. At Birmingham and Mobile, Ala., Little Rock, Ark., and Fort Worth, Tex., the bulk of such street cleaning or sweeping as is done appears to be performed by chain gangs. Some of the largest cities in the country did not report the area swept; of those reporting, Baltimore leads with 17,517,000 square yards swept per week, and Kansas City comes next, with 11,200,000 square yards; Pittsburgh, 10,667,000; Chicago, 8,849,000; Boston, 8,660,000; and Milwaukee, 4,883,000.

STREET RAILWAYS. See ELECTRIC STREET RAILWAYS; RAPID TRANSIT.

STRIKES AND LOCKOUTS. The statistics of strikes and lockouts are not available for 1899. The present article deals with some of the statistics published in 1899, but relating to 1897 and 1898, and with some of the important strikes that occurred in the year 1899.

Great Britain.—The Labor Department of the British Board of Trade published its tenth annual report on strikes and lockouts in the United Kingdom, covering the year 1897. This shows a great increase in the number of persons affected by strikes, and in the number of working days lost as compared with 1896, although the actual number of strikes and lockouts was much smaller. In 1897 there were 864 disputes affecting 230,267 persons, and causing an aggregate loss of 10,345,523 working days. The last-named figure was nearly three times as great as the corresponding figure in 1896, and the number of persons affected in 1897 was about 31,000 greater than in the preceding year; 46.2 per cent. of the persons thrown out of work were involved in strikes in regard to wages and 22.9 per cent. in regard to the hours of labor; but the number of working days lost by strikes over the hours of labor was nearly twice as great as those caused by strikes over wages. The statistics show that the advantages gained by the strikes were chiefly on the side of the employers, 44.5 per cent. of the total number of persons were involved in strikes which were settled wholly in the employers' favor, and 21.6 per cent. in those settled wholly in favor of employees. The disputes compromised affected 32.7 per cent. of

the persons involved in strikes. The greatest number of working days lost was in metal, engineering, and ship-building trades, and the next in mining and quarrying. Among the important trade disputes in the United Kingdom during 1899 was one involving the cotton-spinning trades. The operative spinners demanded an increase of 5 per cent. in wages, and threatened to quit work unless the demand was acceded to. The employers at a conference held at Manchester, March 20, agreed to advance wages, and it was estimated that the advance would affect 75,000 workingmen. Another dispute arose in the building trades over an attempt of the plasterers to force foremen and superintendents to join their union. The Master-Builders' Association declared a lockout, which went into effect early in March, but a compromise was reached toward the end of May.

France.—The report of the labor bureau of the ministry of commerce for 1898 shows that there were 368 strikes in that year, affecting 1967 establishments, and involving 82,065 strikers. As compared with the preceding year, the figures show an increase in the number of strikes and strikers, but a decrease in the number of establishments affected. A far smaller proportion of the strikes succeeded in 1898 than in 1897. In 1898, 12.91 per cent. succeeded; 39.66 per cent. succeeded partly, and 47.43 per cent. failed. The majority of strikes involved members of trades unions. Three of them affected over 100 establishments each, and 286 involved but one establishment each. In the textile industry occurred the largest number of strikes—104 out of the 368—but the largest number of persons involved were in the building trades—46,438 out of the 82,065 strikers. Of the causes or objects mentioned, increase of wages was the most important, both in respect to the number of strikers involved and in respect to the number of working days lost. The majority of the strikes were of short duration, 242 of them lasting for 7 days or less, but 3 lasted for more than 100 days. As to the effects of conciliation and arbitration, the law of 1892 providing for the settling of trade disputes by these means was applied to 94 out of the 368 strikes. Of these 94, 30 cases were settled by the application of the law and 64 failed after application. A strike occurred in May among the postmen as a protest against the action of the senate in refusing to add the sum of 2,000,000 francs to the postal budget voted by the chamber. Several strikes were caused by the cutting down of wages in certain parts of the country, as a result of the law of 1898 concerning accidents of workingmen. A more serious strike than any of these was that of the Creusot iron works, which arose from the suspension of certain workingmen for an infringement of the rules. The real causes have been variously stated. According to one account, the strike arose from too much paternalism in the management of the industry. The men complained that the management interfered with their private liberties; that they were spied upon when absent from work, and that a promise of an increase of wages had not been kept. It was also the desire of the workingmen to found societies of their own and obtain from the proprietor of the works a recognition of their union as a body. The strike resulted in an increase of wages and an accession to the workingmen's demands on other points, and, what was more important, in the establishment of an organization capable of comprising 10,000 workingmen. Another successful strike was that of Montceau-les-Mines on account of certain grievances, one of which was the strict control exercised by the company over the admission of workingmen to the mines. The workingmen's organization was recognized, the strict system of surveillance was abandoned, and certain other concessions were made. At the close of the year a strike was in progress among the miners in St. Etienne over the question of better pay, shorter hours, and a recognition of the workingmen's association.

Denmark.—The greatest strike of the year occurred in Denmark, where the organization of labor has gone so far that it is estimated to include about 4 per cent. of the population as compared with England's 3 per cent. The Danish working classes have not only organized, but have taken an active part in politics. Organized labor was in conflict with organized capital during the entire summer of 1899. A general lockout was declared on May 19, and soon extended to nearly one-half of the organized workingmen. The question of wage rate led to this contest, and it comprised all the building industries. For further details see the article DENMARK.

Belgium.—A strike involving some 60,000 workingmen occurred among the miners of the Liège and Charleroy region, the cause being a dispute over wages. The danger of violence forced the government to mobilize the troops. The coal industry of Belgium was paralyzed, and coal was imported largely from foreign countries. The general result was that the workingmen were obliged to content themselves with the mere promise of increased wages.

United States.—The coal miners' strike at Pana, Ill., which was noticed in the YEAR BOOK for 1898, continued in 1899. The attempts to bring in negro miners led to another riot, and resulted in the killing and wounding of several persons. (For a further account of these disturbances, as well as several other strikes which occurred in Illinois in 1899, see the article ILLINOIS.) A similar difficulty to that at

Pana arose at Mansfield, Sebastian County, Ark., where the union miners struck against the introduction of non-union negro workmen from Kentucky, and where the governor made an attempt to check this importation, but was restrained by the injunction of the federal court. A serious mining strike occurred at Wardner, Ida., where the miners destroyed property to the value of \$250,000, and where the governor was obliged to call on the President for regular troops, the State militia having been largely drawn off to the Philippines. (See IDAHO.) A strike occurred in Colorado over a dispute in regard to the eight-hour law for smelters, the strikers claiming the same wages as had been paid for the longer working day. They went back to work after the law was declared unconstitutional. (See COLORADO.) The strike and boycott of the street railway employees of Cleveland, O., was one of the most important labor conflicts of the year. It arose from the refusal of the company to recognize the union of the employees. The strikers resorted to violence, but finally settled down to the plan of boycotting every one who rode in the street cars or who supported the company even in the most indirect manner. The business men of the city organized a counter-boycott. The strike came to an end in September. See OHIO.

STRUTHERS, Sir JOHN, M.D., LL.D., vice-president of the Royal College of Surgeons, Edinburgh, died February 24, 1899. He was born February 21, 1823; was educated privately and at Edinburgh University. From 1845 to 1863 he was a lecturer on anatomy at Edinburgh, and from the latter year to 1889 was professor of anatomy in Aberdeen University. He was a member of the General Medical Council, 1883-91, and from 1890 to the time of his death was examiner in anatomy at the Royal College of Surgeons, Edinburgh. Among his publications are: *Anatomical and Physiological Observations*, 1854 and 1863; *Memoir on the Anatomy of the Humpback Whale*, 1889; *References to Papers in Anatomy, Human and Comparative*, 1889. He was knighted in 1898.

SUDERMANN. See GERMAN LITERATURE.

SUEZ CANAL, opened in 1869, is 87 miles long, with 21 miles of lakes, and has a depth of 26 feet. The number of vessels annually passing through is now from 3000 to 3500, with a gross tonnage of from 10,000,000 to 12,000,000. British vessels have made up nearly three-fourths, though the number and tonnage of German vessels greatly increased in 1898-99. Few American merchant vessels use the canal. The United States war-ships which passed through in 1898 are said to have paid to the company more than had been paid by this country for all vessels in the previous twenty years. In the first three quarters of 1899 there passed through the canal 2793 vessels, which paid tolls amounting to £2,803,266. At a meeting of the canal company at Paris in November, 1899, the amount of excess dividend to be paid on coupons falling due on January 1, 1900, is said to have been fixed as follows: Ordinary shares, 47.50 francs gross, 43.56 francs net; "actions de jouissance," 35 francs gross, 31.92 francs net; founders' shares, 19.72 francs gross, 18.25 francs net. On November 17, about one week after this meeting, a bronze statue of Ferdinand de Lesseps was unveiled at Port Said.

SUGGESTION, a term used in a technical sense in psychology, though with a very wide application. A suggestion is any sensation or perception which is received by the individual, and leads him to change his mind or actions in accordance with the new idea from without. This usually implies the overcoming of some antagonism on his part, and is connected by some with the force or weakness of the will, a strong will thus asserting itself over a weak will. Suggestion has been shown by several writers in 1899 to be the element common in the various forms of psychotherapeutics—namely, mind cure, faith cure, the cures wrought by Christian Science, by hypnotists, and others; and that suggestibility is a characteristic of the whole human race. The very wide use to which this knowledge can be put will be comprehended when one reflects that suggestion is the basis of all education, that children are particularly suggestible, and that suggestion has as many forms as the objects and circumstances which go to make up the child's environment. Professor E. E. Slosson, of the University of Wyoming, made a very curious experiment in the suggestibility of an audience at a lecture. This occurrence may help to explain how it is possible for an Indian fakir to deceive a large group of people into believing that they see a tree grow from a seed within an incredibly short time while they are gazing at it. He says: "I had prepared a bottle filled with distilled water carefully wrapped in cotton and packed in a box. After some other experiments I stated that I wished to see how rapidly an odor would be diffused through the air, and requested that as soon as any one perceived the odor he should raise his hand. I then unpacked the bottle in the front of the hall, poured the water over the cotton, holding my head away during the operation, and started a stop-watch. While awaiting results I explained that I was quite sure that no one in the audience had ever smelled the chemical compound which I had poured out, and expressed the hope

that, while they might find the odor strong and peculiar, it would not be too disagreeable to any one. In fifteen seconds most of those on the front row had raised their hands, and in forty seconds the 'odor' had spread to the back of the hall, keeping a pretty regular 'wave front' as it passed on. About three-fourths of the audience claimed to perceive the smell, the obstinate minority including more men than the average of the whole. More would probably have succumbed to the suggestion, but at the end of a minute I was obliged to stop the experiment, for some on the front seats were being unpleasantly affected, and were about to leave the room." One writer, H. H. Goddard (*The Effect of Mind Upon Body, Am. Jour. Psy.*), after investigating the various forms of mental healing, and being obliged to acknowledge the reality of the diseases and the efficacy of the cures, emphasizes the fact that the mind is thus shown to have an actual effect upon the building up of the tissues of the human body. The proofs of this are (1) from the various testimony of the faith cure, divine healing, mind cure, and Christian Science healers, many of whose statements the writer personally investigated; and (2) from the statements of regularly practising physicians of good standing, both those who use the hypnotic suggestion and those who state that cures have, in the first place, followed the performance of various operations where nothing was done save mere incision—that is, no part could be found diseased, and so none was cut away, but the patient merely sewed up again. In the second place, many cases are on record where physicians, having tried to no purpose every drug known to them, give some entirely powerless substance, such as a bread pill, assuring the patient that it is an exceedingly powerful drug, a heroic remedy, and that it must be taken with the greatest care to avoid an overdose. It is naturally supposed that the imagination of the patient, being thus aroused, helps the mind to effect a cure. Parallel with this is the frequent improvement of the patient from nothing more than the placing of a glass thermometer in his mouth. If he is ignorant, and takes it for a new and potent medicine, he brightens up immediately. The working of suggestion upon the normal adult is the subject of a paper in the *Année Psychologique* (Vol. V., Paris, 1899) by A. Binet. He reviews recent American and Italian contributions to the subject of suggestion, and adds experiments of his own upon primary-school children. As to the suggestions given to persons in a waking state, considered by the Nancy school to be of the same value as those in the sleeping, or properly so-called hypnotic, state, Binet says they form, when given by regular hypnotizers, a part of the hypnotic suggestions. The ordinary suggestibility of waking persons, however, forms one of the most valuable standards with which to measure the individual. Individuals are thus divided into four classes: (1) The automatic, who obey passively without resistance, and are models of blind discipline; (2) the sensitives, who are influenced by an appeal to their emotions; (3) the actives, or strong-willed, who cannot be directly influenced, but only by exciting some antagonism; and (4) the obstinate, who are not amenable to the suggestions of discipline. This last class is supposed to include mostly physical and mental degenerates. All persons are likewise seen to belong either to a class which accepts, or to another which gives suggestion, the latter forming the active and the former the passive members of society. Being a "suggestor," to use the words Binet here coins, or a "suggestible" does not bear any relation to one's intelligence, as we see the positive character in men of affairs, leaders of parties, etc., who do not belong very high in the intellectual scale. Binet defines suggestion as a moral force (*pression*), exerted by one person upon another. Binet's experiments upon school children showed that the youngest were the most suggestible, while upon adults in general those are most suggestible in the sense of obedient who have been in the habit of giving or enforcing the most unquestioning obedience. Investigation of the methods of the prestidigitator shows that in the forcing of cards in card tricks there is not only a sleight of hand on the part of the magician, but the spectator follows a suggestion in taking the card in question. There are seen to be two tendencies in all individuals—first, to do the usual, the customary, to obey the suggestions of one's environment without questioning—in other words, to fall into a rut, to form a regular habit of action, and follow this without reflection or criticism; second, to question and criticise and form a new decision upon the given suggestion, and in most cases to act contrary to it. The first is seen to lead to automatism, or the performing of acts without thought, sometimes without consciousness; and the latter shows the richest individuality, the greater spontaneity and initiative in affairs. It is this distinction in character which makes suggestibility so valuable a criterion in individual psychology. See HYPNOTISM.

SUICIDES. See VITAL STATISTICS.

SULPHUR. The sulphur produced in the United States comes from the native sulphur and also from pyrite, the latter source being one of growing importance. In 1898, curiously enough, in spite of the war, and that sulphur was a contraband

article, the imports of this material from foreign sources shows an increase of 16 per cent. This was due to an increased demand for sulphur, to be used in the manufacture of powder, for which purpose the sulphur contents of pyrite are not so readily available.

According to the United States Geological Survey, the production of sulphur from these sources in the last two years is as follows:

Material.	1897. Long Tons.	1898. Long Tons.
Sulphur (native).		
Domestic.....	2,631	1,071
Imported (crude and refined).....	141,905	164,504
Sulphur contents of pyrite.		
Domestic.....	64,440	87,014
Imported.....	116,796	113,748
Total.....	325,172	366,337

For the sources of pyrite in 1898 see PYRITE. The native source of sulphur continues to be Utah and Nevada, the Louisiana deposit still remaining idle.

SULU. See UNITED STATES (paragraphs on History).

SUMATRA, a dependency of the Netherlands, is the most westerly of the Sunda Islands, lying to the south of the Malay peninsula, and separated therefrom by the Strait of Malacca. It is divided into five districts—West Coast, East Coast, Benkulen, Lampongs, Palembang, and Atjeh, or Acheen—the total estimated area of which is 161,612 square miles, and the estimated population at the close of 1897, 3,209,037. The inhabitants are chiefly Malays, professing Mohammedanism, and in some of the interior districts their tribal strength is sufficiently great to make the Dutch authority merely nominal. The industries are principally agriculture and shipping, and there is considerable trade in cotton, tobacco, maize, and rice. Coal is found; a recent analysis of the Ombilien coal shows the percentage of carbon to be 77.62. The exploitation of petroleum is declining.

SUNDAY-SCHOOL ASSOCIATION, New York State, is interdenominational, and includes 8752 Sunday-schools, 45 of which were organized during the year, with a total membership of 1,402,123. It held its forty-fourth annual convention at Poughkeepsie, N. Y., June 6-8, 1899; 17,295 conversions were reported; \$321,004.22 was contributed during the year for benevolent objects, \$48,358.27 for State and county Sunday-school work. Rev. A. F. Schauffler, D.D., New York, is chairman of the executive committee; Rev. A. H. McKinney, New York, State superintendent of Sunday-school work; Timothy Hough, Syracuse, N. Y., secretary and treasurer.

SUNDAY-SCHOOLS. The latest figures for Sunday-schools in the world are those of 1893, when there were 37,201 Sunday-schools in England and Wales, with 585,457 teachers and 5,976,537 scholars; in the United States, 123,173 Sunday-schools, 1,305,939 teachers, and 9,718,432 scholars; in the world, 224,562 schools, 2,239,728 teachers, and 20,268,933 scholars. These figures do not include the non-evangelical Protestant denominations or the Roman Catholics, who have about 800,000 Sunday-school scholars.

SUNDAY-SCHOOL UNION, AMERICAN, founded originally in 1791 in Philadelphia as the First-Day Society, was organized in 1817 as the Philadelphia Sunday and Adult School Union. Uniting with other societies, it adopted its present name in 1824. Its objects are: "To concentrate efforts of Sabbath-school societies, disseminate useful information, and endeavor to plant a Sunday-school wherever there is a population." This society has distributed over \$9,000,000 worth of religious literature, maintains about 100 permanent missionaries, and has organized over 1300 Sunday-schools a year for 75 years. The seventy-fifth annual meeting was held in Philadelphia in May, 1899. President, Morris K. Jesup; corresponding secretary, John R. Whitney. Headquarters, 1122 Chestnut Street, Philadelphia.

SUPRARENAL EXTRACT. Definite conclusions have been reached in the past twelve months regarding the availability of the extract of suprarenal glands in medicine. Animals from whom the suprarenal capsules have been removed lose flesh, and suffer from impaired nutrition. Abelsons and Brown-Sequard have both shown that the subcutaneous injection of a watery extract of suprarenal causes a marked improvement in the decapsulated animals and lengthens their life. The extract of the suprarenal capsules is a direct stimulant to the heart and blood-vessels, but its effect is very transitory. Abel has isolated the active principle of the suprarenal gland in the form of a powder of a light gray color. The injection into the jugular vein of a few milligrams of the picrate of this principle caused a great rise

of the arterial pressure, which continued for fifteen minutes. The extract has been used locally as a hemostatic, or astringent, in conjunctivitis, glaucoma, iritis, and in swelling of the mucous covering of the turbinates. The solution decomposes very easily.

SUSPENSION BRIDGE. See BRIDGES.

SWALLOW, GEORGE CLINTON, A.M., M.D., LL.D., geologist, died in 1899. He was born at Buckfield, Me., November 9, 1817; was educated at Bowdoin College, being graduated with the class of 1843. In this year he became lecturer on botany at Bowdoin, and five years later took the principalship of the academy at Hampden, Mo. He became State geologist in 1852, and was called to the chair of geology and chemistry in the University of Missouri. It was chiefly through the efforts of Professor Swallow that the agricultural department of the university was established in 1859. In 1870 he was dean and professor of geology in this department. In 1858 he announced his discovery of Permian rocks in Kansas, the first known in America. In 1865 he was State geologist of Kansas. Professor Swallow took an active interest in the development of silver-mining in Montana. He assisted in constructing the first silver mill at Philipsburg and the first silver furnace at Argenta, and was appointed inspector of mines by Governor Preston H. Leslie. At the time of his death his home was at Evanston, Ill.

SWANWICK, Miss ANNA, well-known English translator and writer, died November 2, 1899. Born in Liverpool, June 22, 1813, she was educated at home, but subsequently studied in Berlin, giving her attention particularly to Greek and Hebrew. In England she devoted herself for a time to the higher mathematics. Later in life she took an active interest in the promotion of female education, especially in the classes for women at King's College, Queen's College, and Bedford College. Miss Swanwick also engaged in philanthropic work, and in connection with the education of the working classes for many years gave lectures on English literature and various other subjects. She wrote *Poets, the Interpreters of their Age* and *Evolution and the Religion of the Future*. Her translations, however, which are chiefly from the German and the Greek, have brought her greater distinction. The German works include: *Selections from the Dramas of Goethe and Schiller*; Schiller's *Maid of Orleans*; Goethe's *Egmont*; his *Tasso*; his *Iphigenia*; and both the first and second parts of *Faust*, with introduction. From the Greek she translated the dramas of *Æschylus*, to which she wrote introductions. Miss Swanwick's *Faust* was probably the most popular English rendering of that drama until the appearance of Bayard Taylor's translation.

SWEDEN, the eastern part of the Scandinavian peninsula, has an area of 172,876 square miles, and a population, estimated on December 31, 1897, of 5,009,632. The only cities with a population of over 30,000 are Stockholm, the capital (population 1897, 288,602), Göteborg (population 1897, 120,552), Malmö (population 1897, 55,500), and Norrköping (population 1897, 38,354). The state religion is that of the Lutheran Protestant Church, other sects being represented in comparatively insignificant numbers, and the Jesuits alone being excluded. The two Swedish universities are at Upsala and Lund. Less than 1 per cent. of the population are unable to read and write. The estimated national revenue and expenditure for the year 1899 were 123,393,000 kronor, the krona being worth \$0.268. The largest items of expenditure were for education and the army, and the largest sources of revenue from customs duties, railways and taxes on spirits. The army is composed of the Vär-fvade or enlisted troops, which must serve two years, the indelta or troops supported by landowners, and the Värnpligtige, which are conscribed annually from men between 21 and 40 years of age. The strength of the army on a peace footing consists of 3728 officers and 33,057 men. The Swedish navy, according to Süssenguth, has 6 second-class battleships, 5 of which are ready for war. The three newest are the *Oden*, *Thor* and *Njord*, of 3400 tons displacement, of the same dimensions as the two new Norwegian armor-clads, though of greater speed. Other vessels are being modernized and armored. The *Dristigheten* was laid down in 1899. The chief agricultural productions are wheat, rye, barley, oats, pulse, and potatoes. The American consul at Stockholm reports that the Swedish crops of wheat, rye, barley, oats, peas, beans, vetches, etc., amounted in 1899 to 101,998,000 bushels, and the potato crop was 33,952,000 bushels. The total weight of all grain and pod crops in 1899 was 2,069,000 metric tons, valued at \$67,616,400 dollars, showing a decrease in metric tons of 247,000. The chief imports are textile manufactures, minerals, mostly coal, and hair and hides; the exports, chiefly timber, live animals and animal food, and minerals. The tonnage of the merchant marine in both domestic and foreign trade was, in 1899, 1008 steam vessels, of 277,492 tons; and 1784 sailing vessels, of 277,582 tons; total—2792 vessels of 555,074 tons. The chief port is Göteborg. In 1897 there were 6350 miles of railway, more than a third of which were owned by the state; and in 1896 there were 8281 miles of telegraph lines, with 25,578 miles of wire, nearly two-

thirds of which were owned by the state. In the same year 64,895 miles of wire and 49,411 instruments constituted the telephone service. The constitution grants executive power to the king, and a legislative function limited by the *Diet*, which has two chambers, one of 150 members (elected for nine years), the other of 230 members (elected by property holders for three years).

History.—For the events of 1899 connected with constitutional question, which has assumed a serious aspect, see the article **NORWAY**. The political parties in Sweden are the Conservatives, the Radicals, and the Moderates, the latest general election, in 1897, having given the Radicals 79 representatives in the *Storting*, a majority of 44 over the Moderates and Conservatives combined. The Radicals are in favor of the demands of Norway for independent consular service and independent foreign office.

SWEDENBORGIANS (**NEW JERUSALEM CHURCH**), the followers of Emanuel Swedenborg, who believe that we have Christ's second coming manifested by the revelation of the spiritual or inner sense of the divine word. The Swedenborgians held the seventy-ninth annual convention at Boston, June 3-6, 1899. Reports of associations and societies of the following districts were read, the figures giving the number of church members in 1899: Canada, 222; Illinois, 873; Maine, 155; Maryland, 412; Massachusetts, 1773; Michigan, 108; Minnesota, 84; New York, 611; Ohio, 515; Pacific coast, 436; Pennsylvania, 665; Connecticut, 65; Denver, 33; Louisville, 15; Savannah, 22; Texas, 86; Topeka, 30. Total, 6274. There were 104 ministers and 95 societies. This is not supposed, however, to include all the believers in New Church doctrines, many of whom attend churches of other denominations. The general convention of the New Jerusalem in the United States was incorporated in 1861. The Swedenborgians maintain the New Church School at Waltham, Mass., and Urbana University, Urbana, O. In 1899 there were 87 societies in England and Scotland, and 167 societies in Mexico, South America, Austria, Denmark, France, Germany, Holland, Hungary, Iceland, Italy, Norway, Portugal, Spain, Sweden, Switzerland, Australia, Asia, and Africa.

SWEENEY, JOHN R., hymn writer and musical director, died at his home in Chester, Penn., April 10, 1899, at the age of sixty-two years. He was one of the best known religious song writers in the United States. Among the scores of hymns written by Sweeney are *Beulah Land*, *Calvary*, *Showers of Blessing*, *More About Jesus*, *Little Ones Like Me*. He was a magnetic singing leader, and was much in demand at the great summer religious assemblies at Ocean Grove, Round Lake, and the Thousand Islands. He edited many song books, the royalties on the copyrights of which were said to be large. For many years Sweeney was professor of music at the Pennsylvania Military College at Chester.

SWIMMING AND WATER POLO. Swimming has been since 1888 a recognized department of sports under the Amateur Athletic Union, by whom it has been fostered. The year 1899 was especially full both in swimming contests and in water polo games, which are becoming more popular yearly. At the Amateur Athletic Union championships, held at New York in September, E. C. Schaeffer, of the New York Athletic Club, established three new records, as follows: 100 yards, across the tide, 1:08 $\frac{3}{4}$; 220 yards, across the tide with 1 turn, 2:53 $\frac{3}{4}$; 440 yards, with 3 turns, 6:48 $\frac{3}{4}$. Schaeffer also made 3 other records during the year, as follows: 110 yards, 6 turns with push-offs, still water, 1:17; 220 yards, 13 turns with push-offs, 2:38; 300 yards, 11 turns with push-offs, 4:07. One other Amateur Athletic Union record was made in 1899, H. H. Reeder, Knickerbocker Athletic Club, swimming 200 yards, 7 turns with push-offs, still water, in 2:38 $\frac{3}{4}$. It is important to note the conditions under which races are held. When the contests occur in tanks the swimmer is allowed to push off from the end walls of the bath when making turns, the effect of which is to increase the speed. A short broad tank is generally faster than a long narrow one, owing to the greater amount of back water created in swimming in the latter. When a race is held in open, still water, the distance is covered, unless otherwise stated, without the use of any object from which to push off at the turns. Some remarkable records were made abroad in 1899, especially in England, where swimming enjoys a wide popularity. The most wonderful swimmer in the world to-day is probably J. A. Jarvis, whose performances in 1899 gave him a fresh claim as the natural successor of the noted J. H. Tyres, now a professional. In 1899 Jarvis swam in Amateur Swimming Association and other races with the following reported results: 440 yards, in 5:51 $\frac{3}{4}$, bath; 500 yards, in 6:38, record; 880 yards, in 12:45 $\frac{3}{4}$, record; reported to have done the same in less time; 1000 yards, 25-yard course, in 13:43, record; 1 mile in 25:13 $\frac{3}{4}$, world's record; long-distance amateur championship (5 miles 60 yards), in 1:09:45. Jarvis's rivals in the short distances are J. H. Derbyshire and F. C. V. Lane, the Australian champion, whose native country vies with England for swimming honors. The latter, in 1899, swam 220 yards in 2:38 $\frac{3}{4}$, bath, record, and 300 yards in 3:46 $\frac{3}{4}$, record. He is also

reported to have swam 880 yards in 10:05½, but the statement is not given here as reliable. He won the 440 yards salt-water championship of the year in 6:30½. His time for the 100 yards English championship, bath, is given as 1:00½. One of the aspirations of swimmers is to make 100 yards in one minute in open, still water. Derbyshire, in 1899, swam 150 yards, bath, in 1:38½. The conditions under which the English races were held have not been obtainable in all cases. Cambridge beat Oxford both in swimming and in the annual water polo games.

Water polo in America has come into being as a natural result of the increasing interest in water sports, and in very recent years it has received a great impetus. Teams consist of 5 men, a goal tender and forward, and the ball is of rubber and inflated. In 1899 the Knickerbocker Athletic Club team carried off water polo honors, with the New York Athletic Club team next. Among the colleges the game appeared first at the University of Pennsylvania. In 1899 there were teams also at Harvard, Yale, and Columbia, including also swimming teams proper. Water polo has been well spoken of as a game that brings out all the competitive ability, strength, and gameness in the make-up of the participants. For spectators it is fully as interesting as the game of ice-hockey.

SWINE-PLAGUE. See SERUM THERAPY.

SWITZERLAND, THE REPUBLIC OF, an inland country of Europe having an area of 15,975 square miles, and a population, estimated in June, 1897, to be 3,082,989. The largest towns were, in 1897, Geneva (population 86,535), Basel (population 89,687), Berne (population 49,030), Lausanne (population 40,671), and Zürich (population 151,994). The report of the United States Commissioner general of Immigration shows that the emigration from Switzerland to the United States in the fiscal year 1898-99 was 1326. Switzerland, being the most mountainous country in Europe, has a very large portion (28.4 per cent.) of unproductive territory. The political division of the country is into 19 entire and 6 half cantons, the most important being Zürich, Berne, Fribourg, St. Gall, and Vaud. The legislative and executive power is vested, by the constitution of 1874, in two houses, the state council of 44 members, 2 elected for each canton and 1 for each half canton for a term of three years; and a national council, made up of 147 delegates, representing the people and elected by the male population, 1 delegate for every 20,000 inhabitants. The president and vice-president of the federal council, the heads of the government, are elected by the two houses annually. The president in 1899 was Edouard Müller, of Berne, and the vice-president, Walter Hauser, of Zürich. The German language is largely spoken in 15 cantons, while French and Italian are spoken in others. The main occupations are agriculture, textiles, building and furniture making. All religious creeds are tolerated, and all sects have liberty of worship except the Jesuits. The people are almost equally divided between Protestantism and Roman Catholicism. Education is obligatory and free. About 1 per cent. of the population is illiterate. There are universities at Basel, Zürich, Berne, Geneva, and Lausanne. In 1897 there were 3331 students, of whom 1526 were foreigners.

The estimated revenue for 1899 was 95,925,000 francs, and the expenditure 98,210,000 francs. The chief source of revenue is the customs (47,000,000 francs), the railways, posts and telegraphs contributing 42,217,400 francs. The public debt in 1898 aggregated 83,891,688 francs, and the net "Federal Fortune" being 77,693,140 francs.

The army, not a standing army in the usual sense of the term, is nominally all citizens of military age. Children of 8 years are given military instruction, which is continued by means of annual exercises and reviews. All male citizens are subject to military duty, the number of such being 527,074 in 1897, of which, however, only about half were organized. Of the organized military there are three divisions, the Elite, or Auszug, the Landwehr, and the Landsturm, the first including men between 20 and 32, the second those from 33 to 44 years of age, and the third those of 17 to 50 years not included, for any reason, in the other two divisions.

The chief imports, which amounted in 1897 to 1,114,442,097 francs, were wheat and flour, silk, cotton, wool, foodstuffs, spirits, tobacco, metals, minerals, animals, timber, machinery, and carriages; and the exports, which amounted in the same year to 747,336,486 francs, consisted largely of silks, cottons, clocks, watches, foodstuffs, tobacco, spirits, cheese, and condensed milk.

The number of miles of railway open in 1897 was 2351, all of which are to come into the possession of the state in 1903. The number of miles of telegraph lines in 1897, owned by the state, was 4410, with 12,823 miles of wire; while the line mileage of private companies was 1204, having 8065 miles of wire.

In 1899 a law was passed introducing compulsory insurance of working people, both against illness and against accident.

SYMONS, General Sir WILLIAM PENN, K.C.B., second in command of the British forces in South Africa, was shot in the fight against the Boers at Glencoe, Natal, October 20, 1899, and died three days later. He was born at Hatt, Cornwall, July

17, 1843. He was educated privately, and at the Royal Military Academy, and in 1863 entered the army as a subaltern in the Twenty-fourth Foot. Promotion came slowly. In 1877-78 he served in the small expedition against the Galekas, a Kaffir tribe. He entered the Zulu War of 1879 as a captain, and after the terrible massacre of Isandlwana, became a major, and received a medal and clasp. It was, however, in the Burmese expedition of 1885-89 that his superiors came to realize his excellent qualities; he showed great talent in the perfection of details and in bringing his men to a high degree of efficiency in musketry and artillery practice. He became a colonel in 1887, and was advanced to the rank of brigadier-general in the Chin field force of the Chin Lushal expedition, 1889-90, and again received a medal and clasp. Symons commanded a brigade in the Waziristan field force, 1894-95, doing brilliant work against the Afghans, and receiving another clasp. In 1897 he commanded the second brigade of the Tochi field force, and in the following year was engaged in suppressing the disorders on the Indian border as commander of the first division of the Tirah expeditionary force. For his services in the latter expedition he was made a Knight Commander of the Bath, and was promoted to the command of the troops in the Sirhind district, India. When in the summer of 1899 the Transvaal situation became strained, General Symons was ordered to proceed to South Africa, and was appointed second in command to Major-General Sir George Stewart White. On October 21 it was announced that Symons was promoted to the rank of major-general for distinguished services in the field.

SYNNOTT, Rev. JOSEPH J., D.D., president of Seton Hall College, South Orange, N. J., died at Montclair, N. J., March 16, 1899. He was born at Great Neck, L. I., February 6, 1863; was graduated at the Roman Catholic College of St. Francis Xavier, New York, in 1882. He then studied at the University of Innsbruck until 1888, receiving the degree D.D. In 1892 he received an honorary M.A. from Yale. He became a member of the faculty of Seton Hall in 1889, and its president in 1897. Dr. Synnott was well known as a linguist, a theologian, and an authority on canon law.

SZELL, KOLOMAN, Hungarian statesman, was premier in the Hungarian ministry formed on February 27, 1899. He was born at Rátót, in Eisenburg, January 8, 1842. After studying at Pesth and Vienna, he was elected in 1867 to the lower house of parliament, where he became a supporter of the patriot, Francis Déak, to many of whose principles he still clings. He has been an active, though not always an especially prominent, member in succeeding parliaments. As minister of finance in 1875, in the first Tisza cabinet, he pursued a policy of great economy and laid the foundation for the restoration of Hungarian finances. On account of the large expense occasioned by the occupation of Bosnia in 1878, he resigned his portfolio and became president of the Hungarian Credit Bank at Pesth. Szell is a member of the Liberal party.

TABOR, HORACE AUSTIN WARNER, once one of the largest land owners in the world, was born at Holland, Vt., November 30, 1830; died in Denver, Col., April 10, 1899. With two partners, in May, 1878, he discovered the "Little Pittsburg" silver mine, which was the basis of his fortune. He subsequently held large grants of mineral and other lands in the Republic of Honduras, and at one time he is said to have owned 175,000 acres of copper land in Texas, and 4,600,000 acres of grazing land in southern Colorado. He built an opera-house in Leadville, and the Tabor Block and Tabor Opera House in Denver; the latter cost nearly a million dollars. He lost his fortune by bad investments, and the panic of 1893; the last of his property was sold in 1897 to satisfy a mortgage. Mr. Tabor was lieutenant-governor of Colorado from 1878 to 1884, and for a month in the latter year served as United States senator. Early in 1898 he was appointed postmaster of Denver, which position he held at the time of his death.

TAIT, LAWSON, M.D., LL.D., one of the foremost authorities on abdominal surgery in England, died June 13, 1899. He was born in Edinburgh, May 1, 1845; was educated at Heriot's Hospital and Edinburgh University. He was house surgeon in the Wakefield Hospital from 1867 to 1870, and in the following year became surgeon in the Hospital for Women at Birmingham, in which city he thereafter resided. From 1875 to 1885 he was a member of the Birmingham town council, and co-operated actively in carrying out the municipal and sanitary improvements inaugurated in that city by Mr. Joseph Chamberlain. Dr. Tait devoted himself to abdominal surgery and the treatment of diseases of women; he improved many of the old methods for operations, and established many new ones; he was held in high regard by physicians and surgeons both in England and America. He wrote a large number of books and papers on his special subjects, and in 1898 published *Diseases of Women and Abdominal Surgery*.

TALIAFERRO, JAMES PIPER, United States senator from Florida, was elected, as a Democrat, by the legislature, April 19, 1899, to succeed Senator Samuel Pasco,

for the term ending March 3, 1905. He was born at Orange Court House, Va., September 30, 1847. After the Civil War, in which he had served as a private in the Confederate Army, he removed to Jacksonville, Fla., his present home, and entered the lumber business. He is now interested in various business enterprises, and is president of the First National Bank of Tampa. For three years he was chairman of the Democratic State executive committee.

TALO. The amount produced in the United States in 1898 was 54,356 short tons, valued at \$411,430.

TALL BUILDINGS. Questions of fire-proofing and fire protection of tall buildings attracted particular attention from engineers and public officials during the year 1899. The new building code of New York City, adopted during the year, contained probably the most comprehensive set of regulations governing fire-protective and fire-proof construction yet enacted by any American city. The principal requirements of these regulations are as follows:

Fire Protection.—All buildings exceeding 85 feet in height must have stand-pipes running from cellar to roof, with siamese connection for fire engines at the curb level, and hose connections on each floor and on the roof. For buildings between 85 feet and 150 feet high stand-pipes must be 4 inches in diameter, with 2½-inch hose connections, and for buildings over 150 feet high this stand-pipe must be 6 inches in diameter. In every such building a steam pump and at least one passenger elevator must be in readiness for the use of the fire department at all times. Where a building extends from street to street, or is L-shaped, so as to have two street fronts, there must be a stand-pipe for each front. All buildings more than two stories high and used for business purposes must have fire-proof shutters for every exterior window above the first floor. Fire escapes must be provided and kept in good working order.

Fire-Proofing.—Every building, to be used as a hotel, lodging-house, school, theatre, jail, police station, hospital, asylum, or institution for the care or treatment of persons, the height of which exceeds 35 feet, and every other building, the height of which exceeds 75 feet, except as otherwise provided, must be built fire-proof. The stairs and staircase landings must be built entirely of brick, stone, Portland cement, concrete, iron, or steel. No woodwork or other inflammable material shall be used in any of the partitions, furrings, or ceilings in any fire-proof buildings, excepting however, that when the height of the building does not exceed twelve stories or more than 150 feet, the doors and windows and their frames, the trims, the casings, the interior finish when filled solid at the back with fire-proof material, and the floor-boards and sleepers directly thereunder, may be of wood, but the space between the sleepers shall be solidly filled with fire-proof materials and extend up to the underside of the floor-boards. When the height of a fire-proof building exceeds twelve stories, or more than 150 feet, the floor surfaces shall be of stone, cement, rock, asphalt, tiling, or similar incombustible material, or the sleepers and floors may be of wood treated by some process, approved by the Board of Buildings, to render the same fire-proof. All outside window frames and sash shall be of metal, or of wood covered with metal. The inside window frames and sash, doors, trim and other interior finish may be of wood covered with metal, or of wood treated by some process approved by the Board of Buildings to render the same fire-proof. All hall partitions or permanent partitions between rooms in fire-proof buildings shall be built of fire-proof material, and shall not be started on wood sills or on wooden floor-boards, but be built upon the fire-proof construction of the floor and extend to the fire-proof beams filling above. The tops of all doors and window openings in such partitions shall be at least 12 inches below the ceiling line.

Fire-proof floors shall be constructed with wrought-iron or steel floor beams tied together at intervals of not more than eight times the depth of the beam. Between the wrought-iron or steel floor beams shall be placed brick arches springing from the lower flange of the steel beams; or hollow tile arches of hard-burnt clay or porous terra-cotta of uniform density and hardness of burn; or arches of Portland cement concrete, segmental in form, which shall have a rise of not less than 1¼ inches for each foot of span between the beams; or between the said beams may be placed solid or hollow burnt-clay, stone, brick, or concrete slabs in flat or curved shapes, concrete or other fire-proof composition, and any of said materials may be used in combination with wire cloth, expanded metal, wire strands, or wrought-iron or steel bars; but in any such construction and as a precedent condition to the same being used, tests shall be made. These tests shall be made by constructing within inclosure walls a platform consisting of four rolled steel beams, 10 inches deep, weighing each 25 pounds per lineal foot, and placed 4 feet between the centres, and connected by transverse tie-rods, and with a clear span of 14 feet for the two interior beams and with the two outer beams supported on the side walls throughout their length, and with both a filling between the said beams and fire-proof protection of the ex-



A TALL BUILDING IN PROCESS OF CONSTRUCTION.

posed parts of the beams of the system to be tested, constructed as in actual practice, with the quality of material ordinarily used in that system and the ceiling plastered below, as in a finished job. Such filling between the two interior beams shall be loaded with a distributed load of 150 pounds per square foot of its area, and all carried by such filling; the platform so constructed being subjected to the continuous heat of a wood fire below, averaging not less than 1700° Fahr., for not less than four hours, during which time no flame will have passed through the platform, and no part of the load shall have fallen through, and the beams shall have been protected from the heat to the extent that after applying to the underside of the platform at the end of the heat test a stream of water directed against the bottom and discharged through a 1¼-inch nozzle under 60 pounds pressure, for 5 minutes, and after flooding the top of the platform with water under low pressure, and then again applying the stream of water through the nozzle under the 60 pounds pressure to the bottom for 5 minutes, and after a total load of 600 pounds per square feet uniformly distributed over the middle bay shall have been applied and removed, after the platform shall have been cooled, the maximum deflection of the interior beams shall not exceed 2½ inches. Any system failing to meet the requirements of the test of heat, water, and weight prescribed shall be prohibited from use in any building hereafter erected. No filling of any kind which may be injured by frost shall be placed between said floor beams during freezing weather, and if the same is so placed during any winter month, it shall be temporarily covered with suitable material for protection from being frozen. On top of any arch, lintel, or other device which does not extend to and from a horizontal line with the top of the floor beams, cinder concrete or other suitable fire-proof material shall be placed to fill up solidly the space to a level with the top of the floor beams, and shall be carried to the under side of the wood floor boards in case such be used. All fire-proof floor systems shall be of sufficient strength safely to carry the load to be imposed thereon without straining the material in any case beyond its safe working load. The bottom flanges of all wrought-iron or rolled-steel floor and flat roof beams, and all exposed portions of such beams below the abutments of the floor arches, shall be entirely incased with hard-burnt clay, porous terra-cotta, or other fire-proof material allowed to be used for the filling between the beams, to which such incasing material shall be properly secured. The exposed sides and bottom plates or flanges of wrought-iron or rolled-steel girders supporting iron or steel floor beams, or supporting floor arches or floors, shall be entirely incased in the same manner. After the floors are constructed no opening greater than 8 inches square shall be cut through said floors unless properly boxed or framed around with iron. And such openings shall be filled in with fire-proof material after the pipes or conduits are in place. All columns, including the lugs and brackets on same, used in the interior of any fire-proof building, or used to support any fire-proof floor, shall be protected with not less than 2 inches of fire-proof material, securely applied. The extreme outer edge of lugs, brackets, and similar supporting metal may project to within ¾ inch of the surface of the fire-proofing.

These requirements for fire-protection and fire-proofing in tall building construction that are now in force in New York represent in their main features modern American practice in this branch of engineering construction. As indicating the value and efficiency of building stand-pipes, tests made in 1899 by the New York City Fire Department demonstrated that a good fire engine coupled to the curb connective was able to force through the stand-pipe enough water to give an efficient fire stream on the roof of the tallest office buildings of the downtown business district. In England unusual attention was aroused respecting questions of fire-proofing and fire-construction during 1899 chiefly through the efforts of the British Fire Prevention Committee, which has undertaken and partly completed an elaborate series of fire and water tests of various forms of fire-resisting, slow-burning, and ordinary non-fire-proof building construction.

TAMMANY, SOCIETY OF, organized in New York City in 1789, had in 1899 a membership of 11,000. General meeting for 1900, in Tammany Hall, East Fourteenth Street, New York City, April 16. Grand Sachem, Thomas L. Feitner; secretary, Thomas F. Smith, 338 West Twenty-second Street, New York City.

TASMANIA, a large island lying about 80 miles south of Australia, is a British colony. It has an area, including adjacent islands, of about 26,215 square miles, and, with Macquarie, 26,385 square miles. Its population was estimated on June 30, 1899, to be about 178,800. The capital, Hobart, has a population, including its suburbs, of about 40,450. Launceston has a population of about 25,000. The principal occupations are agriculture and stock-raising. There are mineral deposits of iron, tin, copper, galena, and coal. There are also valuable forests. The principal exports are minerals, wool, timber, fruit, grain, potatoes, hides and skins, and hops. The imports come mostly from the United Kingdom and Australasia. The United States, though

third on the list, is credited with a comparatively small amount of trade. Her imports are quite considerable, but owing to the fact that most of them are transshipped through colonial importers, especially from Australia, the statistics give no idea of the country of origin. The imports in 1898 were £1,650,018, and the exports were £1,803,369. The public revenue in 1898 was £908,223, and the expenditure, £830,168. The government of the colony is administered by a governor appointed by the crown; a legislative council of 18, chosen for 6 years, and a house of assembly of 37 members chosen for 3 years. The governor in 1899 was Viscount Gormanston. The premier was the Hon. N. C. Lewis. In 1899 the Federal Enabling bill (for a full account of which see the article AUSTRALIAN FEDERATION) was passed by the legislature, and later approved almost unanimously by a popular vote. In October the minister of lands was forced to resign on a charge of corruption. The government was affected in consequence, and a new cabinet was formed. In the autumn troops were offered to the imperial government and accepted for service in the South African war.

TATE, Sir HENRY, died December 5, 1899. He was known as one of the greatest patrons of art in England. He aimed at the recognition in England of the merits of the modern English schools of painting, and with this idea he acquired a collection of masterpieces. These pictures and the building containing them were presented by him to the people of England; the collection includes many important English pictures, and is known as the Tate Collection and Picture Gallery, Westminster. In recognition of his gift he was created a baronet in 1898. Sir Henry was born in Lancashire in 1819. His fortune was made in the sugar-refining business. Besides his patronage of art he made other important benefactions. The Hahnemann Hospital and the Homeopathic Dispensary in London were built by him, and the library of University College, Liverpool. To the same college he also gave £7000 for scholarships.

TAYLOR, CHARLES FAYETTE, M.D., died at Los Angeles, Cal., January 26, 1899. He was born at Williston, Vt., April 25, 1827; in 1856 was graduated as a physician from the University of Vermont and began practice in New York. He became a prominent specialist in the treatment of deformities and diseases of the bones and joints. He was instrumental in founding the New York Orthopedic Dispensary. Dr. Taylor was a member of several well-known medical societies. His publications include: *Theory and Practice of the Movement Cure*; *Sensation and Pain*; *Infantile Paralysis*; *Spinal Irritation*; *Mechanical Treatment of the Angular Curvature of the Spine*; *Treatment of the Disease of the Hip Joint*.

TAYLOR, S. COLERIDGE, English composer, born in London in 1875, was educated at the Royal College of Music, London, studying composition under professor Stanford, violin under Henry Holmes, and the pianoforte under Mr. Algernon Ashton. His compositions attracted attention at the students' concerts, but his first important work was an *Orchestral Ballade in A Minor*, written for the Gloucester (Three Choirs') Festival of 1898. In 1899 he produced the overture and two parts of a *Hiawatha Trilogy*; *Hiawatha's Wedding-Feast* and *The Death of Minnehaha*. The latter was performed at Hanley, and the overture at Norwich. His *Solemn Prelude* was performed at Worcester in 1899.

TELEGONY. See BIOLOGY (paragraph Hybridization).

TELESCOPES, NEW. See ASTRONOMICAL PROGRESS.

TEMPLE, THOMAS, Conservative member of the Dominion senate, died at Falmouth, Nova Scotia, August 25, 1899. He was born at Bampton, England, November 4, 1818. He was elected to the Canadian house of commons for York, New Brunswick, in 1884, 1887, and 1891, and in 1896 entered the senate.

TENEMENT-HOUSE REFORM. See HYGIENE.

TENNESSEE, a central Southern State of the United States, has an area of 42,050 square miles. The capital is Nashville. Tennessee was admitted to the Union June 1, 1796.

Agriculture.—In the season ending August 31, 1899, the cotton area was 896,722 acres, and the production, 322,820 bales; and for the season ending August 31, 1900, the estimated area was 816,000 acres, and the estimated yield, 166 pounds of lint cotton to the acre. See COTTON AND THE COTTON INDUSTRY.

Mineralogy.—According to the annual report of the State Commissioner of Labor for 1898 (issued in 1899), the total number of coal mines in the State is 76, of which 15 were idle during the year. The production was 3,084,748 short tons, valued at about \$2,500,000. Other outputs were, iron ore, 597,777 tons of red and brown hematite; pig-iron, 263,439 tons; copper, 89,721 tons; zinc, 454 tons; manganese ores, 1250 tons; marble, \$316,814; limestone, \$182,402; and phosphate, 272,191 tons. All minerals showed an increased production. In 1899 a New York syndicate acquired the important Ducktown copper property, and expected to begin mining by improved methods in 1900, with the prospect of recovering 12,000,000 pounds annually. Near Columbia

men prospecting for phosphate found a rich deposit of graphite beneath a bed of phosphate 15 feet thick. A Delaware capitalist bought 14,000 acres of coal lands in the Cumberland Mountains, and besides working them for coal will put up 300 solvey coke ovens. Throughout the year the State experienced an unexampled boom in phosphate property, created by the discovery of extensive beds in Maury County. What are said to be the richest phosphate land in the State is in the Mount Pleasant region of Maury County, about 12 miles from the city of Columbia, the rock yielding the blue variety, which brings the highest price in the foreign markets. This industry was most flourishing in Maury, Davidson, Giles, Lewis, and Sumner Counties, and in the former it seemed as if farming had been entirely abandoned. By August 1 more than 10,000 acres of farm lands had changed hands, and many astonishing bargains were reported. The phosphate yields from 5000 to 10,000 tons to the acre, and nets an average of \$3.50 per ton. In the Mount Pleasant district alone, where farming was the rule in 1898, more than 5000 persons were prospecting or working phosphate in 1899.

Manufactures.—During the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$2,173,895. There were 63 manufacturing factories of tobacco, and 62 of cigars, and their output was 5,589,245 cigars, 1,403,067 pounds of plug tobacco, 169,822 pounds of smoking, and 2,111,502 pounds of snuff. Grain and fruit distilleries in operation numbered 158; the amount of fruit brandy produced was 28,550 gallons; spirits rectified, 693,494 gallons; distilled spirits gauged 2,707,500 gallons; and fermented liquors produced, 126,427 barrels.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the delivery ports of Memphis and Nashville aggregated in value \$65,491, showing a steady decrease; exports, none.

Railways.—The new railway construction in the calendar year 1898 was 6 miles, and in 1899, 32.66, giving the State a total mileage of 3102.01.

Banks.—On October 31, 1899, there were 47 national banks in operation and 31 in liquidation. The active capital aggregated \$7,360,000; circulation, \$2,160,933; deposits, \$23,291,255; and reserve, \$7,472,808. The State banks, June 30, 1899, numbered 55, and had capital, \$2,880,329; deposits, \$7,487,316; and resources, \$11,150,477; and stock savings banks, 6, with capital, \$217,500; depositors, 17,678; deposits, \$2,023,686; and resources, \$3,356,448. The exchanges at the United States clearing houses at Memphis, Nashville, and Chattanooga in the year ending September 30, 1899, aggregated \$187,337,528, a net increase of \$1,732,436 in a year.

Education.—The latest common school statistics available at time of writing were for 1895-96, when the school population numbered 720,923, the enrolment being 481,585 and the attendance 338,176. For the school year 1897-98 there were reported 93 public high schools, with 223 secondary teachers, 5357 secondary students, and 4067 elementary pupils; 102 private secondary schools, with 274 teachers, 4899 secondary students, and 7135 elementary pupils; a public normal school, with 28 teachers and 578 students in all departments; and 14 private ones, with 143 teachers and 4244 students. Twenty-four universities and colleges for men and for both sexes reported 18 fellowships, 333 scholarships, 549 professors and instructors, 7139 students, 169,907 volumes in the libraries, valued at \$242,100; \$276,025 invested in scientific apparatus, \$3,414,700 in grounds and buildings, and \$2,406,200 in productive funds, \$455,623 in total income, and \$180,461 in benefactions. Twelve colleges for women reported 180 professors and instructors, 1732 students, 24,878 volumes in the libraries, \$625,500 invested in grounds and buildings, and \$35,000 in productive funds, and \$155,300 in total income. In 1899 there were 300 periodicals, of which 14 were dailies, 229 weeklies, and 39 monthlies.

Finances.—The assessed valuations for 1898 were, acres, \$159,421,612; town lots, \$110,995,934; other property, \$35,698,751—total, \$306,116,297, a decrease in a year of \$5,256,432, and the lowest total in more than ten years. The total interest-bearing debt under the new settlement plan, in February, 1899, was \$16,455,200, and the estimated amount of bonds yet to be funded was \$895,000.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 1,950,000.

Legislation.—Many bills were passed repealing special acts and portions of general acts establishing law, chancery, and criminal courts, which were integral portions of the judicial system of the State. It was also enacted that terms shall be extended as to all cases on trial at the time fixed for the expiration of the term, until such cases are disposed of. All this provoked much public discussion and excitement, and involved the constitutional question whether the legislature has power thus to terminate the functions and emoluments of a judge, constitutionally elected and commissioned, before the expiration of his term. It was claimed that the number of judges was excessive, and that there was a popular demand for retrenchment in judicial expenses, and the legislature claimed to be acting under the power given to it by the constitution to remove judges, for cause, by a concurrent

two-thirds vote of both Houses, which in this case declared that the removals were for economical reasons, and on their face expressly excluded any possible suggestion or inference of personal incompetency, inability, inefficiency, or delinquency. Grave-robbery was made a felony, punishable with imprisonment for not less than two years. Saturday afternoons and the second Friday in May, known as Confederate Decoration Day, were made public holidays. Osteopathy was recognized and regulated. Persons under sixteen years of age cannot marry without written consent of parents or guardians. News agencies are required to sell news to all newspapers and publishers at the same price, thus preventing monopoly in news. Single railroads must not monopolize narrow mountain passes. An elaborate revenue law was passed, which imposes specific occupation and business taxes on nearly every form of business. Uniform text-books, to be selected by a State commission, are required in public schools.

State Officers and National Representatives.—Governor, Benton McMillin; secretary of state, William S. Morgan; treasurer, E. B. Craig; commissioner of agriculture, Thomas Paine; superintendent of public instruction, M. C. Fitzpatrick; comptroller, Theodore F. King; adjutant-general, H. C. Lamb; attorney-general, George W. Pickle. Supreme Court: Chief justice, David L. Snodgrass; associate justices, W. C. Caldwell, John S. Wilkes, W. K. McAllister, W. D. Beard, A. W. McMillin; clerk, James Turney. The State legislature consists of 105 Democrats and 27 Republicans. Senators, Thomas B. Turley, from Memphis; and William B. Bate, from Nashville—both Democrats. Representatives, W. P. Brownlow (Rep.), from Jonesboro; Henry R. Gibson (Rep.), from Knoxville; John A. Moon (Dem.), from Chattanooga; Charles E. Snodgrass (Dem.), from Crossville; J. D. Richardson (Dem.), from Murfreesboro; John W. Gaines (Dem.), from Nashville; Nicholas N. Cox (Dem.), from Franklin; Thetus W. Sims (Dem.), from Linden; Rice A. Pierce (Dem.), from Union City; E. W. Carmack (Dem.), from Memphis.

TENNIS, a modern form of the ancient game of tennis, was introduced into the United States as late as the year 1878, and soon after became one of the national games. One of its best effects was the more general introduction of women to outdoor exercise. Recently golf has taken its place as a popular pastime, but in 1899 a decided revival of interest was shown in tennis, both in private courts and public tournaments. The United States amateur championship was won at the national tournament at Newport, August 15-22, by Malcolm D. Whitman, the champion of 1898. J. Parmley Paret won the singles for all comers, defeating successively M. G. Chase, R. P. Huntington, L. E. Ware, and Dwight F. Davis. The championship doubles were played in two previous tournaments in the East and the West. The winners met at Newport, when D. F. Davis and Holcombe Ward, the Eastern pair, defeated J. A. Allen and H. H. Hackett, the Western champions, and L. E. Ware and G. P. Sheldon, Jr., the 1898 holders of the championship doubles. Tennis critics pointed out as a noticeable feature in the all-around play of the national tournament the consistent, general improvement shown among players of the second and third class. The three leading players of the first class of tennis players in 1899 are officially named as Malcolm D. Whitman, Dwight F. Davis, and William A. Larned. The first ten, as officially ranked in 1899, include, besides these three, J. Parmley Paret, Knight Collins, G. L. Wrenn, Jr., L. E. Ware, Beals C. Wright, Holcombe Ward, and R. P. Huntington, in the order named. R. D. Wrenn did not play in 1899. At the women's championships at Philadelphia, June 20-24, Miss Marion Jones, of San Francisco, won the singles. The championship doubles were won by Miss Myrtle McAleer and Miss J. W. Craven. In the mixed doubles Miss E. J. Rastall and Mr. A. L. Hoskins, Belmont Cricket Club, defeated Miss Craven and Mr. I. P. Gardner, Kenwood Cricket Club. The intercollegiate tennis tournament was held, as usual, at New Haven. The championship was again won by Harvard, Dwight F. Davis taking the singles and Davis and Holcombe Ward the doubles. This tournament is invariably of great interest and it is unfortunate that of the dozen or more colleges which are members of the intercollegiate association, but three organizations enter the tournament annually—namely, Harvard, Princeton, and Yale. This is probably due to the high standard of play that for some time has obtained in these universities, with which the other institutions cannot annually compete. Besides tennis, the older game of court-tennis, played in a covered court, and with more elaborate rules, is coming into favor in this country. It has long been a favorite sport in England. Hand-tennis, or hand-ball, is also played to some extent. See RACQUETS.

TERNINA, MILKA, soprano opera singer, born in Croatia in 1863, studied under Dr. Josef Ganschbacher in Vienna, and in 1890 became prima donna in Munich, where she achieved success. She has sung in many of the important Mozart revivals, and is especially admired in the Wagnerian rôles. She has visited America three times, and is now a member of the Grand Opera Company.

TEXAS, a southwestern State of the United States, has an area of 265,780 square miles. The capital is Austin. Texas was admitted to the Union December 29, 1845.

Mineralogy.—During the calendar year 1898 the production of coal exceeded that of the previous year by 47,393 short tons, and was the highest in the history of the State. The total output of 16 mines was 686,734 short tons, valued at \$1,139,763. All the increase was in the bituminous variety, the lignite declining about 20,000 short tons. Iron yielded 9705 long tons, valued at \$3882; pig-iron, 5178 long tons; gold, 14 fine ounces, value \$300; and silver, 472,900 fine ounces, coining value, \$611,426. Quarrying showed an increased production, with granite to the value of \$4685; sandstone, \$77,190; and limestone, \$70,321—total value, \$152,196 against \$90,788 in 1897.

Agriculture.—Almost all these industries received a serious setback by the widespread flood of midsummer. Cotton, however, made a notable advance, keeping the State in first place, and yielding nearly one-third of the entire crop of the country. In the season ending August 31, 1899, the cotton area was 6,991,904 acres, and the production, 3,363,109 gross bales; and for the season ending August 31, 1900, the estimated area was 6,642,000 acres, and estimated production, 185 pounds of lint cotton per acre. See COTTON AND THE COTTON INDUSTRY.

Manufactures.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$1,577,833. There were 20 manufacturers of tobacco and 149 of cigars, and the combined output in the calendar year 1898 was 12,999,393 cigars and 49,962 pounds of smoking tobacco. Grain and fruit distilleries in operation numbered 21; the amount of fruit brandy produced was 2158 gallons; spirits rectified, 294,661 gallons; distilled spirits gauged, 597,755 gallons; and fermented liquors produced, 299,861 barrels. In common with all the cotton-growing States, Texas shared in the development of cotton manufacturing during 1899. Several new mills were completed and put into operation, and 25 others were in course of organization.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Brazos de Santiago, Corpus Christi, Galveston (\$2,921,366), Paso del Norte, and Saluria aggregated in value \$6,168,136; exports at Galveston (\$78,476,681) and the other ports, \$92,778,133, an increase in a year of \$1,694,232 in imports and \$13,402,844 in exports. The movement of gold and silver was: Imports, \$9,308,404; exports, \$19,282, a decrease in each. The total foreign trade of the year was \$108,274,955, a net increase of \$11,437,371.

Railways.—The new railway construction in the calendar year 1898 was 180.19 miles, and in 1899, 101.60, giving the State a total mileage of 9759.53. In December, 1899, the State authorities approved the charter of the Union Central Railroad, which, under a capital of \$600,000, is to be constructed from Houston to a point on the Red River, near Paris, with branches to Waco and Palestine, the entire mileage being 560. Approval was also given to a bill for the consolidation of the Missouri, Kansas, and Texas and the Sherman, Shreveport, and Southern lines, on condition that the former builds an extension to San Antonio, and the latter one from Jefferson to the eastern boundary of the State.

Banks.—On October 31, 1899, there were 199 national banks in operation and 79 in liquidation. The active capital aggregated \$19,205,000; circulation, \$5,547,513; deposits, \$44,183,531; and reserve, \$13,791,108. There were also, June 30, 1899, 33 private banks, with capital, \$1,096,587; deposits, \$2,849,701; and resources, \$6,703,455. The exchanges at the United States clearing houses at Galveston, Houston, and Fort Worth in the year ending September 30, 1899, aggregated \$378,729,208, an increase in a year of \$26,800,902.

Education.—The revised school census of 1897 showed a total enumeration of 776,867. At the close of the school year 1896-97, the last for which detailed reports were available at the time of writing, the enrolment in the public schools was 612,140; average daily attendance, 404,372. There were 12,953 teachers, 10,234 buildings used as school-houses, and public school property valued at \$6,081,356. The receipts were \$4,349,834; expenditures, \$4,320,271, of which \$3,723,603 was for teachers' salaries. There were 192 public high schools, with 600 secondary teachers, 11,843 secondary students, and 4835 elementary pupils; 71 private secondary schools, with 287 teachers, 4746 secondary students, and 5777 elementary pupils; 3 public normal schools, with 23 teachers and 892 students in all departments; and 8 private ones, with 63 teachers and 1548 students. Normal training was also given in 6 colleges and 39 public high schools. Sixteen universities and colleges for men and for both sexes reported 7 fellowships, 3 scholarships, 279 professors and instructors, 4577 students, 74,569 volumes in the libraries, valued at \$88,750; \$93,075 invested in scientific apparatus, \$1,959,500 in grounds and buildings, and \$720,716 in productive funds; \$344,183 in total income, and \$83,500 in benefactions. Three colleges for women reported 29 professors and instructors, 452 students, \$120,000 invested

in grounds and buildings, and \$52,778 in total income. In 1899 there were 834 periodicals, of which 69 were dailies, 672 weeklies, and 63 monthlies.

Finances.—The assessed valuations for 1898 were: Real estate, \$575,065,595; personal property, \$279,553,860—total, \$854,619,365; tax rate, \$3.80 per \$1000. The total bonded debt, September 1, 1899, was \$3,989,445, of which \$3,261,200 was held by State funds and \$728,245 by individuals.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 2,985,000.

Legislation.—The legislature of Texas requested Congress to call a convention for proposing amendments to the Constitution of the United States, so that an amendment may be submitted to it providing for the formation of irrigation districts and levying taxes to pay for ditches. Depredators on public lands are to be prosecuted. A State entomologist is to be appointed to take means to destroy insects injuring cotton. A corporation court is established in each city, town, and village, with limited civil and criminal jurisdiction. Selling or giving tobacco to a minor under sixteen years of age was made a misdemeanor. With reference to railroads, a law was passed inflicting a severe penalty on any person giving rebates or drawbacks, charging one shipper more than another, giving unreasonable preference or unjust discrimination. Railroads less than thirty miles long may be leased by other roads for not longer than ten years. General officers must reside in and keep their offices in the State of Texas. The railroad commission was given power to fix emergency rates to prevent interstate rate wars.

A strong anti-trust law was enacted, with heavy penalties, including fine, forfeiture of charter, and inability to recover for any article sold or contract made. It prohibits trusts, pools, monopolies, or interference with competition in articles of commerce, insurance premiums, or the gathering or distribution of news. Whitecapping was defined to be the posting or sending of any anonymous notice or threats to do personal violence, with intent to interfere with the right of any person to occupy any premises, precinct, or county, or to follow any occupation. The penalty is imprisonment for not less than two or more than five years.

State Officers and National Representatives.—Governor, Joseph D. Sayers; lieutenant-governor, J. S. Browning; secretary of state, D. H. Hardy; treasurer, J. W. Robbins; comptroller, R. W. Finley; superintendent of public instruction, J. S. Kendall; commissioner of agriculture, Jefferson Johnson; adjutant-general, Thomas Scurry; commissioner of general land office, Charles Rogan; attorney-general, T. S. Smith. Supreme Court: Chief justice, Reuben R. Gaines; associate justices, Thomas J. Brown, F. A. Williams; clerk, Charles S. Morse. The State legislature consists of 2 Republicans, 148 Democrats, and 9 Populists. Senators, Horace Chilton, from Tyler; and C. A. Culberson, from Dallas—both Democrats. Representatives, Thomas H. Ball, from Huntsville; Samuel B. Cooper, from Beaumont; R. C. de Graffenreid, from Longview; John L. Sheppard, from Texarkana; Joseph W. Bailey, from Gainesville; Robert E. Burke, from Dallas; Robert L. Henry, from Waco; S. W. T. Lanham, from Weatherford; Albert S. Burleson, from Austin; R. B. Hawley (Rep.), from Galveston; Rudolph Kleberg, from Cuero; James L. Sladen, from San Antonio; John H. Stephens, from Vernon—all Democrats, excepting Mr. Hawley.

TEXTILE MILLS. According to the most reliable statistics available, a greater number of new textile mills were built and placed under construction in the United States in 1899 than in any year since 1896. At the rate that new textile mill construction is now progressing this country is becoming the largest producer of cloth in the world. One very notable feature of the new construction is that more mills are being built for the production of the finer kinds of goods than ever before. The following figures, given by the *American Wool and Cotton Reporter*, show the principal features of the new mill construction of 1899 as compared with those of 1898:

Item.	1898.	1899.	Item.	1898.	1899.
Cotton mills	158	187	Total Southern mills	181	196
Woolen mills	30	45	" Northern " 	49	103
Knit goods mills	53	40			
Miscellaneous	26	27	Total for United States	230	299

The year also witnessed very extensive additions to existing mills and particularly the re-equipment of these mills with more modern textile machinery. At the close of the year manufactures of such machinery were being pushed to the limit of their capacity to supply the demand.

THAYER, ELI, was born at Mendon, Mass., June 11, 1819; died in Worcester, Mass., April 15, 1899. After his graduation at Brown University in 1845 he taught for seven years, and in 1853 was elected to the Massachusetts legislature. He is remembered as one of the prominent antislavery agitators, and was the originator of the "Kansas Crusade." By this movement he purposed to send into Kansas a sufficient number of antislavery settlers to insure its becoming a free State. To this end he introduced in his State legislature in 1854 a bill to charter the Massachusetts Emigrant Aid Company; under the auspices of this company the towns of Topeka, Lawrence, Ossawatimie, and Manhattan were settled. In 1856 Thayer began a similar work in Virginia, and in two years had founded the town of Ceredo, with about five hundred settlers from New England. He was elected to Congress as a Republican, and was returned for a second term. At the Kansas quarter-centennial Governor Charles Robinson said in Topeka concerning Thayer and his emigrant company: "Without these settlements Kansas would have been a slave State without a struggle; without the aid society these towns would never have existed, and that society was born of the brain of Eli Thayer."

THEOSOPHICAL SOCIETY. See UNIVERSAL BROTHERHOOD.

THERMOL. A new coal-tar derivative less than a year old is thermol, a definite chemical compound with the formula C_6H_5NO . It lowers temperature by dissipating heat, and inhibits heat-production by directly controlling the heat-producing centre. It is said to possess a specific action in la grippe, in which disease it causes a rapid fall of temperature and a decided diaphoretic action, causing as well a general activity in the glandular system. It has also been used in typhoid fever.

THIBET, nominally a province of the Chinese Empire, but practically independent in its internal relations, is a country of Central Asia, which hitherto has been very little explored and of which very little is definitely known. The inhabitants, though mild in character, maintain a stubborn opposition to foreign travellers. The country constitutes the high plateau between the Kwen Lun Mountains on the north and the Himalaya range on the south, or between the Indian province of Kashmir on the west and the Chinese province of Sze-chuen on the east. The great plateau, which in few places is lower than 10,000 feet, contains the sources of several of the great rivers of China and India. The estimated area is 651,500 square miles, and the estimated population, 6,000,000. The seat of the civil government and of the religious authority is the mysterious city of Lhasa, which has a large population and contains many monasteries. The country is under the rule of lamas, or priests, who represent a form of Buddhism. Attempts are being made to increase the Indian trade with Thibet, but as yet there are no British representatives in the country. There are said to be at Lhasa two Chinese residents, who represent the Chinese government. Pursuant to a treaty concluded in the early part of 1894, Yatung, a town beyond the Sikkim frontier, was opened for trade, and an official of the Indian government and a Chinese official were stationed there. The treaty stipulated that for the first five years all articles except Indian tea, drugs, intoxicating liquors, and war munitions should be free of duty. The Indian tea was entirely prohibited. The leading imports into Thibet are cottons, woollens, maize, metals, and tobacco.

THOMPSON, MRS. ELIZABETH, philanthropist, was born at Lyndon, Vt., in 1821; died at Littleton, N. H., July 20, 1899. She was known as the benefactor of the Women's Free Medical College, New York; she contributed to many charities, and gave over \$100,000 for educational purposes. She purchased for \$25,000 the famous painting, "President Lincoln Signing the Emancipation Proclamation," by Mr. Francis Bicknell Carpenter, and presented it to Congress. For this act she was given the freedom of the floor, being the only woman, it is said, who has received this courtesy.

THOMPSON, FRANK, president of the Pennsylvania Railroad Company, died at his home at Merion, near Philadelphia, June 5, 1899. He was born at Chambersburg, Penn., July 5, 1841; was educated at the Chambersburg Academy, and at the age of seventeen entered the Altoona shops of the Pennsylvania Company, where he spent four years in obtaining a practical and scientific knowledge of mechanical engineering. During the Civil War Thompson was chief assistant to Colonel Thomas A. Scott, of the Pennsylvania Railroad, who was assistant secretary of war. Until June, 1864, Thompson did valuable service for the Union in the South and Southwest by building and repairing bridges and railroads, and making possible the transportation of troops and forwarding of supplies, etc. He then accepted the position of superintendent of the eastern division of the Philadelphia and Erie Railroad; but in 1873 he became superintendent of motive power at Altoona for the Pennsylvania system, and a year later was appointed general manager of the system east of Pittsburg and Erie. In this position Thompson introduced various important reforms and improvements, among them being the superior track and equipment of the Pennsylvania road, the picturesque stations, and the system of track inspection and of the block-signal. In

1882 he became second vice-president and five years later first vice-president, and upon the death of George B. Roberts in 1897 he succeeded to the presidency of the great railway system. Thompson was a splendid example of the "self-made" man. He knew the railroad business in all its detail, and had that executive power by which he was able to make his knowledge effective. He was succeeded as president by Mr. Alexander J. Cassatt.

THORNE, SARAH, a notable English actress and theatre manager, died at Chatham, England, February 27, 1899. She was the daughter of Richard Thorne, a manager, and was born more than sixty years ago in London. She first played in pantomime as a child under her father's management and made her professional debut at the Surrey Theatre in London, becoming soon the leading actress at the Theatre Royal, Dublin; at this time she played a classic repertory, including *The Lady of Lyons*, and was associated with G. V. Brooks and Charles Kean. Miss Thorne played frequently in London, made numerous tours, and for many years was the principal actress in the regular Edinburgh season, but she never visited the United States. She is said to have been the first actress to undertake the rôle of Lady Audley in the dramatization of Miss Braddon's *Lady Audley's Secret*, in which she appeared in 1863. Some of the most successful of the younger English actors served under Miss Thorne. Among the older members of the profession with whom she played are Sir Henry Irving, Wilson Barrett, John Hare, Charles Mathews, and Squire Bancroft. Her career as a manager began in 1870, from which time for seven years she had control of the Theatre Royal at Margate, which she was again directing at the time of her death. She had managed theatres in several English towns, and from 1870 her time was given alternately to acting and managing.

TIDES, THEORY OF OCEAN. See ASTRONOMICAL PROGRESS.

TIEMANN, DANIEL FAWCETT, ex-mayor of New York, died in that city, June 29, 1899. He was born in New York, January 9, 1805; was educated privately, and entered his father's business of paint manufacture in 1824, becoming partner three years later, and succeeding to the entire business in 1848. After being repeatedly elected alderman he was chosen mayor, serving as such in 1858-60. He was a State senator in 1871.

TISSANDIER, GASTON, French chemist and aeronaut, died September 8, 1899. He was born in Paris, November 21, 1843; studied at the Lycée Bonaparte, and, having specialized in chemistry, was admitted to one of the laboratories of the Conservatory of Arts. Later he became director of the Laboratory of Experiment and Analysis. After investigating the subject of meteorology he turned to ballooning, and in August, 1868, made his first ascension from Calais; he drifted out above the sea, and returned by allowing the balloon to sink to an air current that was setting landward. After this he made many voyages, and not a few of his observations proved to be of real scientific interest. He sometimes made his ascensions alone and sometimes accompanied by his brother or MM. Sivel and Croce-Spinelli. At the time of the siege of Paris he and his brother escaped in a balloon. In April, 1875, he ascended to the height of about 28,000 feet, an altitude that was fatal to the life of his companion. Tissandier submitted to the Academy of Sciences numerous papers and essays on the subject of aerial navigation. Among his works may be mentioned: *In a Balloon*; *The Souvenirs of an Aeronaut*; *The Application of Electricity to Aerial Navigation*; *Photography in a Balloon*.

TOGOLAND, a German protectorate on the coast of Upper Guinea, lies between French Dahomey, on the east, and the British Gold Coast, on the west. The areas of most of the African territories are indeterminate; that of Togoland is placed by some authorities at 23,160 square miles, by others at 33,000 square miles. The coastline is only 32 miles long, but inland the country broadens out. The neutral zone in the hinterland, which had been determined by Great Britain and Germany in 1888, and which was the last remaining portion of neutral territory in western Africa, has been divided between the British Gold Coast and Togoland, pursuant to the Samoan treaty of November 14, 1899. By this arrangement the territory secured by Great Britain is the larger, while that falling to Germany is said to be more important commercially. The estimated population of Togoland is 2,500,000. Togo, on the lake of the same name, is the chief native town, and has some 8000 inhabitants. Lorne, the chief port, is the capital. Other coast towns are Porto Seguro, Little Popo, and Bagida. The protectorate is administered by an imperial commissioner. Inland are several government stations, and there is a small military and police force. Four missionary societies are at work among the natives, most of whom are Ewe negroes. The country is largely unexploited, but some trade in gum, palm oil, palm kernels, and ivory is carried on. Coffee culture has been introduced, and to some extent maize, bananas, yams, and ginger are cultivated. There are a few native industries, such as weaving, pottery, etc. In the forests are found oil-palms.

the rubber tree, dyewoods, and the cacao tree. The imports are chiefly cotton goods, tobacco, and spirits. The imports and exports in 1896 amounted to 1,886,840 marks and 1,651,416 marks, respectively; in 1897 imports, 1,975,940 marks; exports, 771,025 marks. The value of the mark in United States currency is \$0.238. Customs duties are the chief source. Togoland is said to be the only German colony that is almost self-supporting.

TOLSTOY, Count LEO, was born in 1829. By descent he belongs to one of the oldest families of the Russian nobility. Educated for a military career, he served as an officer in the Russian army through the Crimean War. He made his début in literature by his war sketches, which at once secured for him a place among the great masters of Russian prose. Resigning from the army, he devoted himself entirely to literature. Within the next decade he wrote his *War and Peace*, a historical novel from the Napoleonic times, remarkable for the masterly portrayal of the characters, taken from all walks of life. It was not, however, the literary genius of Tolstoy that first made his name known beyond the boundaries of the Russian Empire; but, on the contrary, that which most of his countrymen would call his vagaries, and the "Westerners," his religious teachings. In truth, Tolstoy's philosophy lacks all originality, being nothing but the current philosophy of Russian "Nihilism" so called, divested, however, of its revolutionary mantle. Tolstoy's idealization of peasant life in a primitive agricultural community is that of Russian "populism" (*narodnitchestvo*) of the seventies. His abhorrence of all modern civilization—commercialism, science, and all—can be easily traced through Russian "populism" to the apostle of anarchy, Michael Bakunin. Tolstoy's Christianity is not the unsophisticated faith of the Christian believer in Christ—God. His Christ is a social reformer, the forerunner of nineteenth-century Socialism, as penned by the early writer of Russian "populism"—Colonel N. Sokolov, *Les Réfractaires*. Nor is the interest he has taken in the Russian sect of "Doukhobors" and their emigration from Russia, first to Cyprus, and last year to Canada, original with him. It dates back as far as the early sixties with the founders of "Nihilism," to whose imagination the dissident movement among the Russian peasantry recalled the days of the peasant wars in Germany or the Puritan movement and the revolution in England. The numerous sects among the Russian peasantry had been a subject of thorough study with a number of "populist" writers of the seventies and early eighties before they attracted the attention of Tolstoy. And, lastly, the most conspicuous characteristic of Tolstoism, the ethical doctrine of perfectibility, is a marked feature of Russian "Nihilism" of the days of Tchernyshevsky, as well as of its later development, the "populism" of the seventies.

Tolstoy's doctrine of non-resistance grew out of the political reaction in Russia under Alexander III., which followed the revolutionary or terrorist period of 1878-81. All opposition of any form was ruthlessly crushed by the iron hand of the government. Resistance to "evil" was hopeless. Political or social reform appeared like a visionary dream; pessimism was the philosophy of the day. At a different epoch, brought home to us by another great Slav writer, Henryk Sienkiewicz (*Quo Vadis*), similar conditions created religious martyrs. Amid the agnostic atmosphere of Russian educated society the counterpoise of pessimism was supplied by the secular quasi-Christianity of Tolstoy, which showed to the active altruists a new road to philosophical salvation—by setting to the darkened world examples of ethical lives. The few Tolstoyan settlements of university men and women founded in the rural districts differ from similar settlements of the "populist" period of the seventies only in that they have discarded the element of revolutionary propaganda, which insures them greater permanency, although by no means complete immunity under the Russian police régime. Their imitations in England are of a kind with the numerous communistic experiments, beginning from Robert Owen's down to our own day.

Tolstoy's latest production, *The Resurrection*, which appeared in 1899, leads the reader through that period in contemporary Russian history in which Tolstoism has found its origin. As in *War and Peace*, the all-embracing vision of the greatest pen-artist of our times takes in all conditions and classes of men, from the imperial palace down to the overcrowded prisons along the great Siberian highway. The author admirably succeeds in that which proved the stumbling-block of no meaner a talent than that of Tourgueniev; in Tolstoy's new work we are for the first time presented with real-life pictures of the men and women of the Russian revolutionary, or "Nihilist," movement. That they are not treated like criminals is but natural with a Russian author. Even the most biassed pictures, bordering on the caricature, from the pens of the pro-government writers of fiction, have at no time attempted to represent them otherwise than as rebels or "enemies of society." Tolstoy is, however, entirely free from all bias in the opposite direction, which makes, for example, of Stepniak's *Underground Russia* a chapter of hagiology. The genius of Tolstoy manifests itself in his ability to think and feel as each of his characters

would think and feel himself; you are, as it were, in a theatre, where the world's greatest players enact before your mental eyes the drama of real life.

TONQUIN, or TONKING, formerly a province of Anam, but a French colony since 1884, occupies a part of the Indo-Chinese peninsula, and lies to the south of the Chinese province of Yunnan, east of the Burmese Shan states, and north of Anam. The country comprises 14 provinces, the area of which is 34,740 square miles, and the estimated population, which includes 8000 villages, is 9,000,000. Including the Laos territory, annexed by France from Siam in 1893, the total area is 135,000 square miles, and the population, 12,000,000. The chief town and seat of government, Hanoi, on the Hanoi, or Song-koi River, is said to be an aggregation of villages, with a population of about 150,000. The country is governed by a resident under the French council of Indo-China; there is an army of occupation, numbering about 19,000. The principal crop is rice, the export of which goes mostly to Hong-Kong; other products are cotton, silk, sugar-cane, fruits, tobacco, and pepper. The chief port and trading centre is Haiphong. At Hongay, near this place, and at Kebao are coal deposits, worked by French companies. There are also copper and iron mines. The leading imports are machinery and other metal goods, tissues, yarn, and beverages. There is a railway 64 miles long. See **INDO-CHINA**.

TORONTO, UNIVERSITY OF. See **PSYCHOLOGY, EXPERIMENTAL**.

TOWER, CHARLEMAGNE, LL.D., was promoted by President McKinley on January 10, 1899, from the post of minister to Austria-Hungary to that of ambassador to Russia, to succeed the Hon. Ethan Allan Hitchcock, who had been called to the portfolio of the interior in the President's cabinet. Mr. Tower was born in Philadelphia, April 17, 1848, and after studying at a military academy in New Haven and at Phillips Academy, Exeter, entered Harvard, and was graduated in 1872. During the next four years he travelled in Europe, visited Palestine and Egypt, and devoted himself to the study of history, modern languages, and literature; he studied particularly at the University of Madrid, at Paris, Tours, and Frankfort-on-the-Main. Returning to America, he studied law in Philadelphia, and was admitted to practice in 1878. From 1882 to 1887 he lived in Duluth, Minn., where he became president of the Duluth and Iron Range Railroad and managing director of the Minnesota Iron Company. Mr. Tower has large interests, and is an officer and director in several corporations. He has been vice-president of the Historical Society of Pennsylvania, is a trustee of the University of Pennsylvania, and a member of the Academy of Natural Sciences, of the American Institute of Mining Engineers, and of the Numismatic Society. In March, 1897, he was appointed minister to Austria-Hungary; his successor in this position is Mr. Addison C. Harris (*q. v.*). Mr. Tower has written *The Marquis of Lafayette in the American Revolution*.

TOWNSEND, LAWRENCE, United States minister to Belgium, on April 15, 1899, was transferred to this position from the embassy at Lisbon, to succeed Mr. Bellamy Storer, appointed minister to Spain. Mr. Townsend was born August 13, 1860, in Philadelphia; there he was educated at the Mantua Academy in 1872-77, and entered the University of Pennsylvania, but was not graduated. After passing five years in ranch life in western Colorado he went to Europe to study international law and the history of diplomacy, and while thus engaged made a number of translations in these subjects from the French and German. Under President Cleveland he was appointed—1893—first secretary of legation at Vienna, where he remained until the spring of 1897, when President McKinley appointed him minister to Portugal. He was succeeded at Lisbon by Mr. John N. Irwin.

TOWNSHEND, Fifth Marquess of, JOHN VILLIERS STUART TOWNSHEND, died October 29, 1899. He was born April 10, 1831, and was educated at Eton. From 1850 to 1854 he was a clerk in the foreign office, and from 1856 to 1863 represented Tarnworth, as a Liberal, in Parliament. In the latter year he succeeded his father to the title. He is succeeded by his son, the Viscount Raynham, who was born in 1866.

TRACK and FIELD ATHLETICS. See **ATHLETICS, TRACK and FIELD**.

TRACT SOCIETY, AMERICAN, founded in 1825, has distributed up to 1899, 475,788,587 copies of religious books and pamphlets to many millions of families in all parts of the world. President, General O. O. Howard; secretaries, W. W. Rand, D.D., and George L. Shearer, D.D. Offices, 150 Nassau Street, New York City.

TRADES UNIONS. The report on trades unions in the United Kingdom for the year 1898 was issued by the Board of Trade in 1899. This gives the figures for 1267 trades unions with a membership of 1,644,591. It shows a decrease in the number of separate unions, but an increase of some 2 per cent. in the membership over 1897. The amount of funds in the hands of the one hundred principal unions in 1898 was about \$13,474,000, and their income about \$8,651,000, amounting to a per capita contribution of \$8.29. The amount expended by these unions in the past seven years

was \$53,636,830. The distribution of these funds for the period 1892-98 was as follows: Dispute benefit, 23 per cent.; unemployed, 23.3 per cent.; working expenses, 17.7 per cent.; sickness and accident, 16.2 per cent.; funeral and other expenses, 11.2 per cent.; superannuation, 8.6 per cent. The report of the British delegates who were present at the Detroit convention of the American Federation of Labor in December, 1899, showed the remarkable progress of unionism in Great Britain. One of these delegates said that the unions in Great Britain numbered 1267, with 1,644,591 members, and an accumulated fund of \$23,500,000. The one hundred principal unions had over a million members; thus 8 per cent. of the unions control some 63 per cent. of the membership, and by far the greatest portion of the fund. According to a recent report of the French Bureau of Labor, the number of trades unions in France was 2324, with a membership of 437,793.

Labor Congresses in Great Britain.—At the thirty-second annual congress of trades unions, held at Plymouth, England, September 4-9, 1899, there were 385 delegates present, representing 147 organizations with a membership of 1,120,164, a falling off in the number of organizations, delegates and members as compared with the preceding year. The congress passed resolutions upon a great variety of subjects, including a recommendation for eight-hour bills for certain industries, for the representation of workingmen in parliament, for the better housing of the people, for municipal bakeries, public education, co-operative production, and old-age pensions, and resolutions concerning the restriction of Sunday trading, juvenile labor, etc. The place of meeting for the 1900 congress was fixed at Huddersfield. On January 24-26, 1899, the question of a federation of trades unions was discussed at a special labor congress held at Manchester, where 288 delegates representing organizations having a total membership of nearly one million were present. The meeting resolved in favor of a general federation of trades unions to improve the status of workingmen, promote unity of action and industrial peace, and maintain the rights of combination among workers.

Labor Convention in the United States.—On December 11, 1899, the American Federation of Labor held its annual meeting at Detroit, Mich. The 200 delegates present represented organizations having a membership of about 800,000. The presence of British delegates bore witness to the efforts which have been made for some years to form a closer union between the labor organizations of the United States and those of Great Britain. The most significant result of the congress was its declared opposition to anti-trust legislation as likely to injure organized labor. In the report of the president, which was accepted by the federation, the laws to prevent combinations and trusts were condemned as likely to deprive labor of the benefits of organization. The congress also declared against the principle of a general boycott on account of the difficulties in the way of its application.

TRANSVAAL, THE, known officially as the South African Republic, lies on a lofty plateau in the interior of South Africa, at an elevation of from 4000 to 6000 feet above the sea. This descends toward the north to the Limpopo or Crocodile River, which forms the northern boundary and flows toward the Indian Ocean. The southern boundary is formed by the Vaal River, which empties into the Orange River, below Kimberley, in Cape Colony, the seat of the diamond industry. The great gold fields of the Transvaal lie between these two rivers, in the Witwatersrand or White Water range of hills. The Transvaal is entirely surrounded by other states. Portuguese possessions and Zululand, a province of Natal, shut it off from the eastern coast, while British possessions hem it in on the north and west. On the south lie the Orange Free State and the British colony of Natal. The area of the republic is 119,139 square miles, and the population, according to an estimate made in 1898, is 1,094,156. Of this number 748,759 were natives and 345,397 were whites, the latter numbering about 3 Boers to 7 Outlanders. Probably 80 per cent. of the Outlanders were British. The capital, Pretoria, had a population of about 12,500, of whom 10,000 were whites. Johannesburg is the largest town, and a mining centre of great importance. Its estimated population in 1899 was 106,000, of whom 60,000 were whites, mostly Outlanders. The Kaffirs, or natives, make up most of the remaining inhabitants, with a few Malays, coolies, and Chinese. The Boers are almost wholly devoted to agriculture and stock-raising, although the natural produce of the land is not sufficient for the wants of the people. The Outlanders, on the contrary, are confined mostly to industrial, and especially to mining pursuits. The great mineral product of the Transvaal is gold, which was discovered about 1885 in the Witwatersrand hills. The South African Republic now contains the most important gold fields in the world. In 1897 the output of the Witwatersrand mines was for a number of months over £50,000 every 24 hours, and the total output of the Transvaal in that year was about £11,653,725 (\$56,162,743), that of the United States being at the same time £12,208,411, or \$59,412,232. In 1898 the total amount of Transvaal gold mined reached 4,555,000 ounces, valued at £17,000,000, or \$82,722,000, while that of the United States was about £13,214,000, or \$64,300,000. The world production in 1898 was valued at £59,423,000, so that Transvaal gold furnished nearly a third of the

year's total supply. Most of the ore comes from the Witwatersrand or Johannesburg fields. The next important are those at Barberton. In the first nine months of 1899 the output of the Johannesburg mines was 3,913,810 ounces, as compared with 2,677,917 for the first nine months of 1898. Soon after the close of this period, in October, 1899, the war with Great Britain broke out. The United States consul-general in Cape Town wrote as follows on November 4 regarding later mining conditions in South Africa: "The exodus of Outlanders from the South African Republic and Orange Free State has, I believe, been unprecedented in history. Many of these people—the mining population, the bone and sinew of the country—have scattered over the world. Numbers of them, too poor to get out of the country, are subjects of charity in the cities of Cape Colony and Natal, and have to be fed. Johannesburg, in the Transvaal, and Bloemfontein, in the Free State, are, to all intents and purposes, deserted cities. Johannesburg, the largest commercial centre in South Africa, has, so far as trade is concerned, ceased to exist. This once busy, bustling city, producing monthly over 15 tons of gold and yearly \$60,000,000 worth, is silent. Up to this time goods have reached the Transvaal via Delagoa Bay, but it is not supposed that they will long be permitted to enter. The two republics must then live on their own resources. Their crops are ready for the sickle, but cannot be cut, as the men are off to the war. Large quantities of gold en route to seaports in this colony for shipment to England have been taken by the Boers." Some years ago the discovery of the rich South African diamond fields was made in territory at that time claimed by the Boers. After the diamond discoveries, however, British rule was proclaimed over the area which contains the fields, and the Transvaal permanently lost a rich source of income. In 1897, however, diamonds were discovered at Reitfontein. In 1898 the output of the Pretoria district was 11,025 carats, valued at \$43,151, and that of the whole Transvaal 22,843 carats, valued at \$212,812. The size and value of the stones is less than of those found at Kimberley in Cape Colony, or at Jagersfontein in the Orange Free State, but the output gradually increased in value during the two years between the discovery of the district and the outbreak of the war. There are a few other minerals, including considerable unworked iron deposits. About 1,953,000 tons of coal were produced in 1898, most of which was taken by the mines. There are a number of important railroad lines. A trunk line starts at Pietersburg, in the north, passes southward through Pretoria and Johannesburg, traverses the Orange Free State, and terminates at Port Elizabeth and Cape Town in Cape Colony. This is known as the Netherlands railway. A second runs eastward from Pretoria into Portuguese territory, and terminates at Lourenço Marques on Delagoa Bay. It is over this road that the Transvaal government was able to keep up connection with the world after the outbreak of war, as it is the only railroad to the seaboard running through neutral territory. British possessions, in fact, enclose the two Boer republics on all other sides. A third railroad starts at Johannesburg, and runs southwestwardly into Natal, which it enters through a tunnel under Laing's Nek. The latter is a pass in the Drakenburg Mountains, near Majuba Hill. Thence the railroad passes to Durban, the port of Natal, by way of Ladysmith and Pietermaritzburg. A road leads westward also from Johannesburg to Krugersdorp, and thence via Potchefstroom into the Free State, where it connects again with the Pietersburg-Cape Town Railroad. Johannesburg is connected by wagon-road with the all-British Cape Town-Bulawayo Railroad, 1360 miles long, which closely follows the western frontier of the Transvaal. The state religion is that of the United Dutch Reformed Church, whose estimated membership in 1895 was about 30,000, with as many more in other Dutch churches. Next in membership comes the English Church, followed by the Wesleyans, the Jews, the Presbyterians, the Catholics, and members of other Christian churches. About 12,000 children attend the state schools. The latter include village and ward schools, a model school, a gymnasium, and a girls' school. There are many English and other denominational schools in Johannesburg, Pretoria, and elsewhere. The finances of the republic have greatly improved since the discovery of gold, the revenue having increased from £177,407 in 1882 to £4,480,218 in 1897. The importance of mining to public finance may be seen from the sources of revenue, which in 1897 were import duties, £1,276,319; Netherlands Railway, £737,366; prospecting licenses, £427,230; explosives, £300,000; stamps, £258,396; posts and telegraphs, £215,320. The expenditures in 1897 amounted to £4,394,066, including £1,012,866 for public works, £996,960 for salaries, £396,348 for the war department, and £271,435 for the purchase of explosives. The receipts of the Mining Commissions Department at Johannesburg were £896,044 and the expenditure £101,369. The public debt in 1898 was £2,675,690. About £147,000 were direct liabilities to the British crown, the remainder being included in the "Rothschild loan." The payment of the debt to Great Britain is provided for by a sinking fund, and is to be extinguished at the end of a stated period. The Transvaal government holds a considerable amount of territory, including the Barberton gold fields.

The constitution of the South African Republic, which has been amended in various ways down to the year 1897, provides for a president, S. J. Paul Kruger



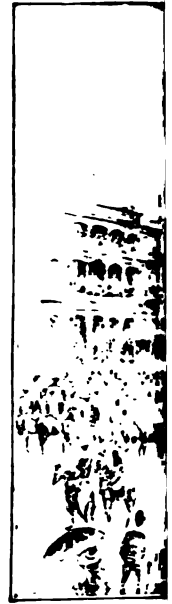
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SCENES IN THE TRANSVAAL.—1. Johannesburg since the exodus of Uitlanders. 2. Johannesburg since the exodus of Uitlanders. 3. Johannesburg since the exodus of Uitlanders. 4. Scene in Church Square, Pretoria. 5. A company of General Jan Piet Joubert, commander in chief.



Raadzaal.

4

Dutch Reformed Church.



5



6

sburg before the exodus of Uitlanders. 3. A sortie with the armored train from
er Prisoners on the way to Pietermaritzburg. 6. Commandant
he forces of the South African Republic.

(q. v.) being the executive in 1899, and for a parliament composed of an upper and a lower chamber, with 27 members each, called the First and Second *Volksraad*. Members must be Protestants, at least 30 years of age, and possess certain property qualifications, and are elected for 4 years. Members of the upper house are elected by what are known as first-class burghers, no others having the right to vote. To possess the rights of a first-class burgher, one must be a male white person resident before May 29, 1876, or a veteran of the 1881 war of independence, or the Jameson raid, or various other campaigns. His rights then extend to his children from the age of sixteen. The lower house is voted for by the second-class burghers, who comprise naturalized male aliens and their children over 16 years of age. The latter must register on becoming of age, and come into their rights at the age of 18 years. Aliens may become naturalized after two years' residence, and in special cases they may be naturalized in a shorter time. By special legislation sons of aliens may become first-class burghers after 10 years from naturalization. By limiting the votes of second-class burghers to the election of the Second *Volksraad*, or lower house, whose bills must be approved by the First *Volksraad*, the Boers have managed to prevent the government from falling to the control of the alien whites, or Outlanders. The president and commandant-general also are elected by first-class burghers only.

HISTORY.

In order to understand the conflict in South Africa, which has been the main feature of the history of the Transvaal during the year, it is necessary to examine the previous relations between England and the Boers. The racial antagonism, which is at the root of the present struggle, springs from causes that reach far back in the history of South Africa, and for that reason the historical writings are generally tinged with partisanship, and there is hardly a stage in the history of England's gradual expansion in South Africa that is not involved in controversy. At the same time, a brief historical sketch which shall present both sides may be of service. The history of South Africa may be divided into four periods. First, from the British occupation of Cape Colony in 1814 down to the date of the South African independence in 1852. Second, from the latter date to the assumption of British sovereignty in 1877. Third, the period of the first Anglo-Boer war, and of the conventions of 1881 and 1884. Fourth, the period from the discovery of gold in the Rand in 1885 to the present time, comprising as its leading feature the discontent of the alien element in the Transvaal.

To the Sand River Convention.—When the Dutch established a port of call at the Cape in 1652, the dominant native race was the Bantu, which had pushed southward from Central Africa, and occupied the region which now comprises Matabeleland, Bechuanaland, the Boer Republic, Swaziland, and Zululand, driving the Hottentots and Bushmen into Natal and Cape Colony. Thus it was the Hottentots with whom the Dutch first came in contact. It was only later, when the limits of the Dutch settlements extended, that they encountered the Bantu tribes—that is, the Kaffirs, Zulus, Basutos, Bechuanas, and Matabeles. The thieving propensities of the Hottentots laid the foundation of a bitter hostility toward the natives on the part of the Dutch, and from the very first the relations between the two races were unfriendly. The Dutch colony was controlled by the East India Company, a close corporation whose governor had arbitrary powers. As a result of the Napoleonic wars, Cape Colony came into the possession of England in 1806, and, by a convention signed in 1814, the English occupation was made permanent. The historians, whatever be their sympathies, agree that England's policy in her new possession was unwise in the extreme. In the first place, the same arbitrary form of government was set up by the English, and any form of resistance to the command of the governor was treason. Dutch customs and traditions were disregarded and English became the official language. But the main cause of the irritation was the government's interference with the Dutch policy toward the natives. The Dutch were accused of great cruelty in their dealings with the native tribes, and on one occasion they were charged by a member of the London Missionary Society with nearly one hundred murders of natives. The government found this charge greatly exaggerated, but the methods employed to procure witnesses and seek out the supposed murderers provoked a feeling of distrust on the part of the Dutch which could not be dispelled. Their bitter enmity toward the missionaries dates from this time. The suspicion that the English authorities were trying to fasten on them crimes which they had not committed was increased by the attempt of the authorities to arrest one of the Boers for an assault upon a native slave. The accused party rallied his friends around him and resisted the arrest, with the result that he himself was killed and five of his comrades were arrested and afterward put to death. What is regarded by some as a still more important cause of the ill feeling between the Dutch and the English was the abolition of slavery. Slavery was practised by the Dutch, and it is estimated that at the time of the Emancipation act (December 1, 1834) there were 40,000 slaves in the colony. The main cause of complaint was the manner in which

of apprenticeship. That slavery in some form or other was practised appears probable from several independent sources, although the Boer writers have denied it. Another point urged by the defenders of England's policy is the constant danger of war which resulted from the Boer's attitude toward the natives. At the same time a condition bordering on anarchy developed within the Transvaal itself. It had passed through a period of currency inflation, and in 1876 was absolutely bankrupt. Taxes could not be collected, the salaries of public officers were unpaid, and there was no public credit. And while the country was without resources for its own defence, the Zulus were gathering their forces and preparing to invade the Transvaal. In 1877 Sir Theophilus Shepstone, a special commissioner from the British government, arrived in the Transvaal under authority to annex that country to Great Britain, if such a course met the wishes of the inhabitants, and appeared to be justified by the circumstances. At this crisis many of the Boers regarded annexation as the only course of safety. President Burgers appeared to acquiesce in the necessity of annexation. In an address to the *Volksraad* he declared that it was a choice between the adoption of very radical changes in the government or annexation to Great Britain. The whole tenure of his speech seemed to be that affairs were hopeless, and that annexation was the only way out of the difficulty. After an investigation lasting about three months, Sir Theophilus Shepstone proclaimed the annexation of the Transvaal, having first submitted the draft of this proclamation to the president, and modified it according to his suggestions. The president and the Boer executive council made a formal protest, which was understood by the commissioner as merely for the purpose of preventing a certain party of Boers from causing a disturbance.

From 1877 to 1885.—This whole episode of annexation is a subject of dispute, some writers claiming that the great majority of the Boers, including the better element, were in favor of annexation, and others seeing in the whole movement nothing but the designs of the imperialists. The next step on the part of the British was to settle the Zulu question. Finding it impossible to make the Zulus restore certain property which they had seized and to give up some marauders demanded by the British, war was made upon them, with the result that the Zulus were finally subdued and Zululand annexed by Great Britain. Soon after the annexation of the Transvaal the Boers showed hostility toward the new régime. The executive council sent commissioners to England, one of whom was Vice-President Kruger, to protest against annexation, and on the return of these commissioners there was a movement to submit the question of British rule to a plebiscite, but the authorities would not make any concessions. There is sharp criticism of the British policy at this point. In the first place, it is said by pro-British writers that, while the proper policy would have been one of firmness and consistency, the British government wavered and delayed. It made a serious mistake in recalling Shepstone, who had won the respect of the Boers, and supplanting him by a military officer, whose rigorous methods made him unpopular. At the same time the protest against annexation was met by a refusal to consider the reopening of the question. It was said again and again that the Transvaal should remain under British control. Yet popular opinion in England on the subject was changing, and the spokesman of the anti-annexationists was Mr. Gladstone, who, in 1880, declared that the government ought to restore the Transvaal, since it was acquired by means dishonorable to the country. In the meanwhile the Boer population was preparing for war. The history of that short campaign, so disastrous to the British, need not be repeated here. The Boers were prompt in taking the field, and their victories at Laing's Nek, Nicholson's Nek, and Majuba Hill bore witness to their superiority in that kind of fighting. These victories coincided in time with the change in policy on the part of the government. In less than two months from the date of Mr. Gladstone's speech, calling upon his country to give back the Boers their independence, his party came into power. Yet at first he replied to a letter from the Boers, requesting the restoration of independence, with the statement that "looking at all the circumstances, our judgment is that the Queen cannot be advised to relinquish her authority over the Transvaal." The English and the Boer loyalists thought they had every reason to believe that the British government would maintain its control over the Transvaal. But Kruger and the anti-annexation element continued their hostility, and on December 13, 1880, proclaimed the South African Republic. The Gladstone government now completely reversed the British policy. In spite of the many declarations that British rule would not be given up, the Gladstone ministry now determined to treat with the Boers on the basis of their independence. For this act Mr. Gladstone has been sharply criticised. Some have accused him of lack of foresight, and even cowardice. Others have confined themselves to saying that it was a premature attempt to carry "into international affairs the principle of the gospel." The friends of Mr. Gladstone, however, characterized his conduct as in the highest degree magnanimous. It was based on the feeling that England had been in the wrong, and that the only

thing for her to do was to recede from her position. To do this after reverses on the battle-field required the highest courage, since her motives would no doubt be misinterpreted. The practical effects of Mr. Gladstone's policy were injurious. On the strength of previous assurances many inhabitants of the Transvaal had remained loyal and some of them had fought on the British side. These people regarded themselves as betrayed by what they called their undeserved desertion by the government. England's conduct was not interpreted as the result of magnanimity among the Boers, but was construed as simple cowardice. It gave the Boers confidence in their military power, and in the opinion of many writers greatly strengthened the Afrikaner sentiment, and encouraged the ambition for the establishment of a strong Afrikaner state which should rival the British in South Africa. In 1881 peace was concluded, and in the same year the Pretoria convention granted the Boers their independence under the suzerainty of the Queen. In 1884, the Boers having objected to the terms of this arrangement, a new convention was concluded in London, which made no express reference to suzerainty, and granted the Transvaal its entire independence, subject to the right of the British government to reject treaties formed by the republic with foreign powers. The status of the Transvaal under these conventions has been the subject of sharp dispute in connection with the events of 1899, and an outline of the discussion will be found in a later paragraph.

From the Discovery of Gold to 1899.—Since 1885, when the discovery of gold in the Witwatersrand began to draw large numbers of foreigners into the republic, the main feature of its political history has been the relations between the government and this constantly increasing body of alien settlers, known as the Outlanders. Among them there were representatives of every race, but the predominant element was British. So rapid was this influx of foreigners, that in a short time the population of the two mining centres, Johannesburg and Barberton, exceeded that of all the rest of the Boer Republic. The attitude of the Boer government toward these Outlanders, since it furnished the occasion of the war of 1899, is naturally involved in controversy, and there is hardly a point connected with it that is discussed in an impartial manner in the works hitherto published. For that reason the best way of presenting the subject is to outline the arguments on each side. The Boer side of the case may be summed up as follows: Previous to the discovery of gold the naturalization laws had been liberal, but as the alien population became more numerous the qualifications for citizenship were raised. In 1881 the franchise was granted for two years' residence. In 1885 the term of residence was raised to five years, and in 1887 to fifteen years. The reason for this was the danger ever present in the minds of the Boers that their nationality would be "swamped" by the extension of full rights of citizenship to the Outlanders. These Outlanders were most of them British subjects, and suspected by the Boers of hating all Dutch institutions. The Boers appealed to their previous history. They had receded before the British farther and farther into the interior in order to be rid of what they considered an oppressive form of government. Now to permit a transfer of political power from the descendants of the very men who had fled from British oppression to those who would no doubt do all that they could to bring the Transvaal under British authority seemed the height of folly. Again, it was argued that these Outlanders came into the country merely to enrich themselves, and that they would then return to their homes, and the transfer of political power to a floating element like this was not to be thought of. In the so-called grievances of the Outlanders and the sympathy which these grievances enlisted among the British, the Boers saw only the working of imperialistic ideas. To them it seemed that these grievances were to be made the pretext for interference with the Transvaal. The imperialists were openly aiming at a confederation of British South Africa, and the extension of British power to the Zambesi, and the inclusion of the Transvaal within the sphere of British control appeared to be a part of this programme. The two Boer republics blocked the way of the imperialistic schemes of Mr. Cecil Rhodes. Hence, the Boers argued, these alleged grievances of the Outlanders would naturally be made the most of. The rich mine owners in the Rand were in sympathy with the imperialist policy. Thus, there was a strong party within the republic and without which was seeking to destroy its independence. In these circumstances it was reasonable that they should not consider very respectfully the demand of the Outlanders. But if any further justification was needed for their suspicions of the Outlander element and their imperialistic friends, it was afforded by that criminal attempt known as the Jameson Raid. Dr. Jameson was a member of the British South Africa Company, and his attempt upon the Transvaal was regarded by the Boers as the culmination of a conspiracy between the managers of the South Africa Company and the alien element in the Transvaal. The association between Dr. Jameson and the Outlander organization, known as the National Union of the Transvaal, is obscure, but the Boers did not doubt that there was complicity between them, and they more than suspected the complicity of prominent British imperialists, who were secretly sup-

ported by the colonial government. Moreover, the action of the British government after the failure of Jameson's raid, and the capture of him and his followers, was not vigorous enough to allay the Boer suspicion. The Outlanders were naturally viewed with greater distrust than before. The National Union, though it carried on its agitation by peaceful means, made little headway. In general, the Boers denied that the Outlanders were oppressed, but they offered to introduce certain reforms in answer to some of the complaints which appeared to be well founded.

The British contention rests upon, first, the somewhat technical and complicated discussion of the conventions of 1881 and 1884, and, second, upon the more important matter of the Outlander grievances, which were held to justify interference on general ground of equity.

The Conventions.—The claim of certain British writers that intervention was justified on the ground that Great Britain still retained suzerainty over the Transvaal involves a purely legal discussion. The convention of 1881 in its preamble grants "complete self-government, subject to the suzerainty of Her Majesty, to the inhabitants of the Transvaal territory upon certain terms and conditions and subject to certain reservations and limitations." This language seems to subject the Transvaal Republic not only to the suzerainty of the British government, but to certain restrictions in its internal government. The annexation of the republic was nowhere formally renounced, and the right of self-government was made the subject of an express grant under certain limitations. The Boers, not satisfied with the status which this language implied, now tried to induce the British government to withdraw its assertion of suzerainty. This was refused on the ground that the Transvaal was not in fact an independent state, but, at the same time, a concession to the Boer demands was made to the extent of concluding a new convention in 1884, known as the London Convention, which did not contain certain articles imposing limitations and restrictions upon the internal government. In this convention the only reference to reserved British rights was that in regard to approval or rejection by the British government of treaties between the Transvaal and foreign states. The discussion of the status in which this new convention placed the Transvaal is marked by the assertion of extreme claims on each side and is complicated by the different interpretation which was placed upon the convention at the time of its formation. The extreme British claim is that the new convention was merely a concession in form, a change in wording to avoid giving offence to the national pride of the Boers, and that British suzerainty was not affected by this change in phraseology. It was claimed that the Transvaal delegates at London knew that the British government did not mean to give up anything essential. It is also claimed that from oral assurances and from the use of the term "the inhabitants of the Transvaal" that political rights were not recognized as appertaining to the Boers alone, but to the other elements in the population. It was held, too, that the preamble of the 1881 convention remained in force, and some even maintained that it justified interference in the internal affairs of the Transvaal in certain circumstances. One writer goes so far as to say that it cannot be maintained that the convention of 1884 superseded that of 1881. According to this view, the disappearance of the term suzerainty from the convention of 1884 did not invalidate Great Britain's suzerain powers, which were still implied, if not expressed, and further there were certain restrictions and limitations imposed upon the Boers in their internal government. This is an extreme view. Unfortunately, the word suzerainty was differently understood at the time when it was employed. Mr. Gladstone held that it was related to sovereignty, but altogether distinct from it; Lord Salisbury, that it did not preclude interference in internal affairs; Lord Kimberly, that it carried with it the transfer of authority over internal relations. This diversity of view was apparent in the course of the debates in the House of Commons in 1881. As to the purport of the convention of 1884, the more generally accepted opinion was that expressed by Lord Derby, who told the representatives of the Transvaal Republic that the omission of certain articles in the 1884 convention left the Transvaal government free to manage its own internal affairs without interference, and to shape its foreign policy as it chose, provided it observed the single requirement that a treaty draft must be subjected to the Queen's approval. This view of the matter did not, however, suit the extremists on the other side. Their arguments seemed to assume that the South African Republic was in reality a sovereign international state, and there were signs that they were trying to make Great Britain's acknowledgment of this a condition precedent for any concession to the demands of the Outlanders. The attempts of British writers to justify interference on strictly legal ground have not been generally successful. The stronger basis of their claim was that of equity, and the arguments which have carried the most weight have been based upon considerations of British paramountcy in South Africa, of the so-called right of higher civilization, and of the obligation to protect British subjects against oppression. The British claim rests chiefly on the

right to insist that her subjects in the Transvaal shall enjoy the same privileges as she accords to the alien elements in her own South African colonies. It is conceivable that, apart from strict principles of international law, the grievances of a nation's subjects residing in another country may be such as to warrant interference. It is therefore important to consider these grievances in detail.

Outlander Grievances.—There was a marked economic antagonism between the interest of the Outlanders and the Boers, the former being essentially industrial and the latter being almost wholly agricultural. There was a scarcity of capital in the Transvaal before the discovery of gold, and consequently an insufficient basis for taxation, but, with the influx of the large mining population and the increase of wealth, an extensive body of capital accessible to the tax-collector came into existence. The government took advantage of this new condition. It levied a tax on the mines and a tariff on imports. Naturally these burdens fell chiefly upon the Outlanders. The farmers suffered but slightly from it, since they consumed comparatively little of the goods upon which taxes were levied. Thus, the financial situation gave the Outlanders one great cause of complaint, and the denial to them of political rights prevented any redress of this grievance. In April and May, 1899, the discussion of the Outlander grievances attracted much public attention. A petition, signed by 21,648 Outlanders, was submitted to the British government, asking for intervention on their behalf. In general, it blamed the Transvaal government for withholding political rights from the European residents, who, it said, bore the greater part of the public burdens. The following summary gives the principal grievances of which the Outlanders complained: First, the Boers have levied excessive taxes on articles of domestic consumption, and these have imposed a heavy burden upon the Outlanders. The latter, being without political rights, have thus been taxed without representation. Second, in spite of the heavy taxation, the government has not furnished a proper water-supply or sanitation. It has not protected its citizens from violence, and it has permitted the liquor trade with natives. A general charge of corruption was made against the administration. Third, the Boers have prevented the majority of the population from using their own language in the law courts. Fourth, a religious test is imposed and inquiry as to a man's religion is made before admitting him to state employment. Roman Catholics are not employed by the South African Republic. Fifth, the police force has shown great brutality, as illustrated by the killing of the Englishman Edgar on the mere appearance of an intention on his part to resist arrest, and also by their resort to a system of espionage and by threats of violence on the occasion of reform meetings. On the other hand, the police have not supplied adequate protection against crime. Sixth, the law courts have been wholly under the control of the executive and judges who would not act as mere creatures of the government were dismissed. An illustration of this was the action taken in the case of Justice Koetze, who was known to be a friend to the civil liberty of the individual. He was replaced by Justice Gregorowski, who was a mere tool of the executive. Seventh, the liberty of the press is denied, and newspaper editors have been harshly treated for publishing views opposed to the administration. Eighth, the minority—that is, the Boers—have been allowed to carry arms, while this has been forbidden to the majority, who have thus been placed on the same footing with the disarmed blacks and earned the nickname of "White Kaffirs." The special grievances complained of by the capitalists were the dynamite monopoly, the tariff on machinery, chemicals, etc., and the tax on mines. The demands of the Outlanders were that there should be an equitable franchise with a fair representation; that the constitution should be reformed by a body representing the whole people; that there should be improvements in the efficiency of the civil service; that religious disability should be removed; that liberal education should be provided for; that the Dutch and English languages should be placed upon the same footing; that South African products should be admitted free of duty, and that the legislature should be responsible to the heads of departments. These grievances represent not only those which were expressly mentioned in the petition, but those which were discussed by the Outlanders and their friends in the South African and British press. In general, the Boer authorities, while admitting that some of these grievances should be redressed, considered the claims excessive, and denounced the appeal for intervention as wholly unwarrantable. This was the state of affairs when an attempt at settlement was made by the Bloemfontein conference May 30, 1899.

Bloemfontein Conference.—It was finally decided to hold a conference at Bloemfontein, in the Orange Free State, between President Kruger, of the South African Republic, and Sir Alfred Milner, the governor of Cape Colony and the high commissioner for South Africa. In the meanwhile, on the 16th of May, the Transvaal government had caused the arrest of eight Outlanders, nearly all Englishmen, on the charge of fighting against the republic. This further angered the Outlanders and their sympathizers, many of whom declared that there had been no plot, and that it

was merely a pretext on the part of the Transvaal government for employing still harsher measures against the Outlanders. The negotiations at Bloemfontein lasted from June 2 to June 6, but did not result in a settlement of the points at issue. The main question discussed was the franchise of the Outlanders, although some other points, like the dynamite monopoly of the Transvaal government and the murder of the Englishman Edgar by the Transvaal police, came up for discussion. It was the plea of the Outlanders that the present state of affairs, whereby the government of the republic was in the hands of the minority, was intolerable and must come to an end. Until recently a residence of fourteen years was required for the full franchise, and since the mining industry in the Rand had not reached its present importance fourteen years ago, this requirement virtually excluded the Outlanders from all political life. The Transvaal government had, to be sure, consented to the reduction of the term of residence from fourteen to nine years, but this was not regarded by the Outlanders as a sufficient concession. The demands which Sir Alfred Milner preferred at the conference were as follows: 1. That the term of residence required as a qualification for the franchise should be changed to five years, and should be retroactive in effect, bestowing the franchise on all the Outlanders who had been five years resident in the Transvaal. 2. That the vote of naturalization should be modified, so that the new citizen should not be required to renounce the country of his birth. 3. That the new population should be fairly represented in the *Volksraad*. 4. That naturalization should carry with it immediately the right to vote. 5. The franchise to comprise a property qualification. President Kruger submitted the following counter-propositions: 1. A residence of two years should be required for naturalization, after which the full right to vote should follow at the expiration of five years. 2. That all persons settled in the Transvaal before 1890 should have this right at the end of two years. 3. That the population of the mining district should be largely represented in the *Volksraad*. 4. That one of the conditions of naturalization should be the possession of a certain amount of property, the value of which was specified. 5. Naturalized citizens should give proof that they had enjoyed civil rights in the country where they had formerly lived. 6. That the form of naturalization should correspond to that of the Orange Free State. 7. That these propositions were made on the condition that Great Britain would accept arbitration for all differences which might thenceforth arise between the two countries. The members of the conference could come to no agreement upon these points. To Great Britain the last proposition of President Kruger was the most displeasing, since to admit the principle of arbitration between the Transvaal and Great Britain seemed to the latter a violation of her suzerain rights over the Transvaal. Sir Alfred Milner declared that his government would "not have any foreign interference at all between them and the South African Republic." The situation though critical was not hopeless. President Kruger appeared earnest in his wish to conciliate Great Britain. The *Volksraad* approved the principle of the concessions which the president had offered, and expressed regret that the high commissioner had not accepted them.

Diplomatic Negotiations.—Nevertheless, the war feeling in Great Britain gained ground. Mr. Chamberlain added somewhat to its bitterness by his speech at Birmingham on June 26, in which he blamed the Transvaal government for its egotistic and oppressive policy, and implied a doubt of the good faith of President Kruger. Nevertheless the Transvaal *Volksraad* voted a law, based on the principle of electoral reform, which President Kruger had proposed—namely, the naturalization of the Outlanders at the end of seven years, which was to be retroactive in effect. But there was no adequate provision for a distribution of seats, and the new concessions did not apply to presidential elections. On July 27 Mr. Balfour made a rather sharp speech against the Transvaal, saying that England would not be content with what the Transvaal had offered. At the end of July an important debate occurred in Parliament, where the speeches of Lords Salisbury and Selborne in the House of Lords and that of Mr. Chamberlain in the House of Commons indicated that in the opinion of the Government the Transvaal concessions were insufficient, and it was doubtful if they would be carried out in good faith. On August 2 Mr. Chamberlain sent, through Sir Alfred Milner, a proposition to the government of the Transvaal looking to the nomination of a mixed Anglo-Boer commission which should investigate the nature and the probable results of the electoral law that had been voted by the *Volksraad*. The law, while falling far short of what the British government desired, was still an important step in the direction of reform. The British government did not reject this compromise. The commission which Mr. Chamberlain proposed was merely for the purpose of ascertaining how far the new law was a real measure of reform. The demand for such a commission does not at first sight seem excessive, but it met at once with opposition from the Transvaal government, since it seemed to establish a precedent for the interference of the British government in the internal affairs of the Transvaal—an interference which in the course of time it was feared would gain wider scope and in the end lead to complete British control. Neverthe-

less, the Boer government gave much thought to the matter, and it was not until August 22 that it submitted its reply. In the meanwhile Parliament had been prorogued, and Mr. Chamberlain was free to conduct the affair without the embarrassment of parliamentary comment. On the last day of the session he had given evidence of his fixed determination to enforce his demands upon the Transvaal government. In reply to a member of the house, who had called in question the extreme measures that had been adopted against the Boers, he said that British ascendancy in South Africa was clearly imperilled by the obstinacy of the Transvaal government in refusing justice to the Outlanders and that it was a state of affairs that could not be endured much longer. He concluded with the declaration that the government had put its hand to the plough and would not turn back. President Kruger's reply on August 22 to Mr. Chamberlain's proposal for a mixed commission was somewhat evasive. It did not actually accept or reject the proposal for a commission of inquiry, but submitted certain counter-propositions which emphasized the concessions which had been made to the Outlanders, and explained that the conditions which he had imposed were necessary for the safeguarding of his country's independence. His counter-propositions were: 1. That the electoral franchise should be accorded at the end of five years, as Sir Alfred Milner had demanded at the Bloemfontein conference. 2. That eight new members should be added to represent the mining districts, which would bring the number of Outlander representatives in the *Volksraad* up to ten out of a total membership of thirty-six, and that the proportion of their seats should never fall below one-fourth. 3. That the new citizens should have the same right to vote as the old citizens in all elections, including those for president and commandant-general. 4. That the government of the Transvaal should receive through the British agent and should submit to examination all amendments which the government of Great Britain should see fit to suggest in respect to the administration of the new franchise law, provided that Great Britain would renounce its pretensions to suzerainty over the Transvaal, and would accept the principle of arbitration with the exclusion of every foreign element, with the exception of the Orange Free State. 5. The interference of Great Britain in the present circumstance should not be taken as a precedent. Here the question of suzerainty at once assumes the greatest importance. Mr. Chamberlain showed himself strongly opposed to the conditions offered by the Transvaal government and professed to regard the question of suzerainty as of vital interest to Great Britain. He published a blue book, giving an account of the negotiations between the two governments down to this point. As to suzerainty, it should be noted that it was definitely expressed in the convention of 1881, which had regulated the relations between Great Britain and the Transvaal, but in the convention of 1884 the word suzerainty did not occur, and the Transvaal government contended that it had ceased to exist in fact as well as in name, holding that the convention of 1881 had been superseded by the adoption of that of 1884. On August 26 Mr. Chamberlain made a speech in which he attacked President Kruger and the obstinacy of the Boers, contrasting with it the patience which Great Britain, "a sovereign power," had shown in dealing with a "vassal nation." He spoke openly of the possibility of a rupture. The reply to the Transvaal government was published on August 30. In this Mr. Chamberlain said that he could not understand why his proposal for a commission of inquiry in regard to the operation of the law had not been favorably received. He now proposed a commission which should consist wholly of Englishmen. As to the interference of Great Britain in the internal affairs of the Transvaal, he said he hoped there would be no need for such interference in the future if equal rights were accorded to the Outlanders, but that the government could not abandon the rights which the conventions of 1881 and 1884 had conferred upon it, nor could it renounce its obligation to protect its citizens in another country. His opinion in regard to the suzerainty was contrary to that of the Transvaal. He accepted the principle of arbitration, but declared that certain differences might arise between the two countries which could not be settled by such a court of arbitration. He suggested that a new conference should be held at Cape Town for the purpose of discussing this question of arbitration. It was the opinion of the Boers and their sympathizers that throughout all these negotiations it was the wish of the London government to push the Transvaal government to extremes; that the question of the franchise was only a pretext; that the matter of the suzerainty was only a means for attaining ends which it was not expedient to disclose; that in forcing war England had in view not only the assertion of her sovereignty over the Transvaal, but the establishment of her power over all South Africa upon a firm basis. Great Britain wished to add to her prestige in Cape Colony, where the Afrianders had a majority in Parliament. In fact, the conduct of the British government throughout all this was merely the part of a wider scheme involving her complete supremacy in South Africa. In the Cape Government the ministry of Sir J. G. Sprigg had been replaced by an Afriander cabinet under Schreiner. The Dutch population of the Cape sympathized with the Transvaal, and it was feared that they would make common cause with their fellow-Boers. The

party in opposition there tried to induce the government to prevent the transportation of arms and munitions from the colony to the Orange Free State on the ground that these arms were destined in part for the Transvaal and would be used against Great Britain if war broke out. The Afrikaner premier refused this, alleging the treaties between Cape Colony and the Free State. (See *CAPE COLONY*.) On the other hand, the position of the British government was that the acceptance of the condition on which the concessions were offered would mean the complete abrogation of British control over the external as well as internal affairs of the South African Republic. This was too high a price to pay for the same privileges which Great Britain freely granted to the alien element in her own colonies, and which, therefore, she could demand on principles of equity from the Transvaal. It was too much to expect that she should bargain away her suzerainty. In the official reply of August 30 it was stated that the British government could not pledge itself to abstain from protecting its subjects if protection was needed, and could not give up the rights secured to it by treaties and conventions. It refused to discuss the question of suzerainty.

As time went on it was more and more certain that war was destined to break out. To the continental press it seemed that England was trying to force the Transvaal into war. Few writers either in France or Germany could find anything to say on behalf of Great Britain. To almost all it seemed that under the pretence of honesty and fair play she was working steadily to overthrow the independence of the Transvaal. There was profound disbelief in the declaration of the British government that it was intervening in the interest of the Outlanders. On September 8 a despatch of the Pretoria government was published, expressing regret that Great Britain refused the terms offered in the despatches of August 22. It still held, however, to the law granting the franchise after seven years, and declared that it was not opposed to the holding of an inquiry upon the operation of the law, although it expected no advantage to come from it. Thus it withdrew the concessions of August 22, the British government having refused to abrogate its suzerainty. Mr. Chamberlain replied to this despatch from the Transvaal on September 12. He began by repudiating anew the claim of the republic that it should be treated as a sovereign international state. He next announced that he considered the law granting the seven-year franchise unsatisfactory, but that he continued to accept the concessions offered on the 22d of August, on the condition that an inquiry, mixed or unilateral, should prove that the operation of the new electoral law is not impaired by vexatious and restrictive regulations. Finally he demanded another concession—namely, that the new members of the *Volkswaad* should be allowed to use their own language in debate, and he implied that the Transvaal government had itself suggested this to the British agent. If Great Britain's demands were accepted, the government was ready to arrange for a new conference to settle details of the proposed court of arbitration and other matters referred to in the note of August 30, with the exception of Outlander grievances and the interpretation of the conventions. His despatch concluded with references to the increasing danger of prolonging the present situation and insisted upon an immediate and definite reply, in default of which the British government would consider the whole situation anew and formulate its own propositions. The reply of the Transvaal was published on the 17th of September. It was negative. It said in substance that the conditions which it had imposed upon the concessions of August 22 were essential, since they alone could insure the independence of the republic. It denied that the suggestion had been made to the British agent that the representatives of the Outlanders should be allowed the use of their own language. The despatch also declared that the propositions of August 22 had been made because the British agent had given the Transvaal government to understand that they would be accepted by Mr. Chamberlain. Complaint was made that the representative of the English government had acted in bad faith. As to the new conference proposed by England, the Transvaal government was not opposed to it in principle, but it desired that the matters with which it should concern itself should be precisely stated.

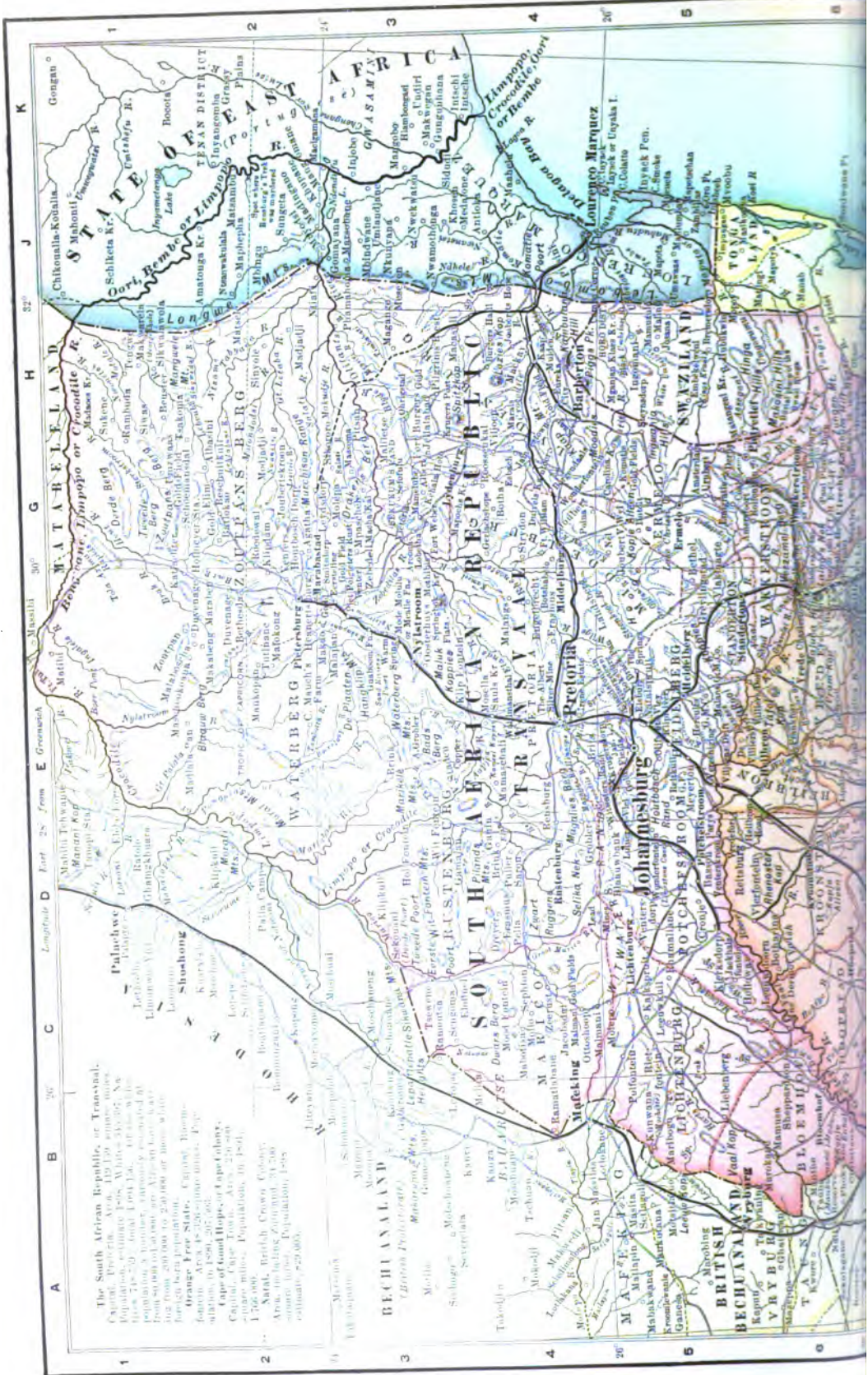
The tone of this reply seemed injudicious to many who had hitherto sympathized with the Boers. It was a common opinion that since Mr. Chamberlain in his despatch of September 12 asked less in some respects than President Kruger had shown a willingness to grant, these demands would be accepted. The Boer attitude seemed to many uncompromising and even defiant. It was clearly seen that the real point at issue was whether Dutch or British supremacy should prevail in South Africa. A Dutch republic with an international status seemed to threaten the British colonies in South Africa, and to menace the whole imperial programme on the African continent by alliances with foreign powers. On the other hand, British suzerainty over the Transvaal seemed to some a very small matter. Prominent Liberals, not in sympathy with wide imperialistic projects and strong in the Gladstone traditions, saw in it only a pretext for ambition. It seemed to them wholly inadequate as a cause of war.

The next important event in the history of the affair was the calling of a council of the cabinet at London, on September 22. After this meeting Mr. Cham-

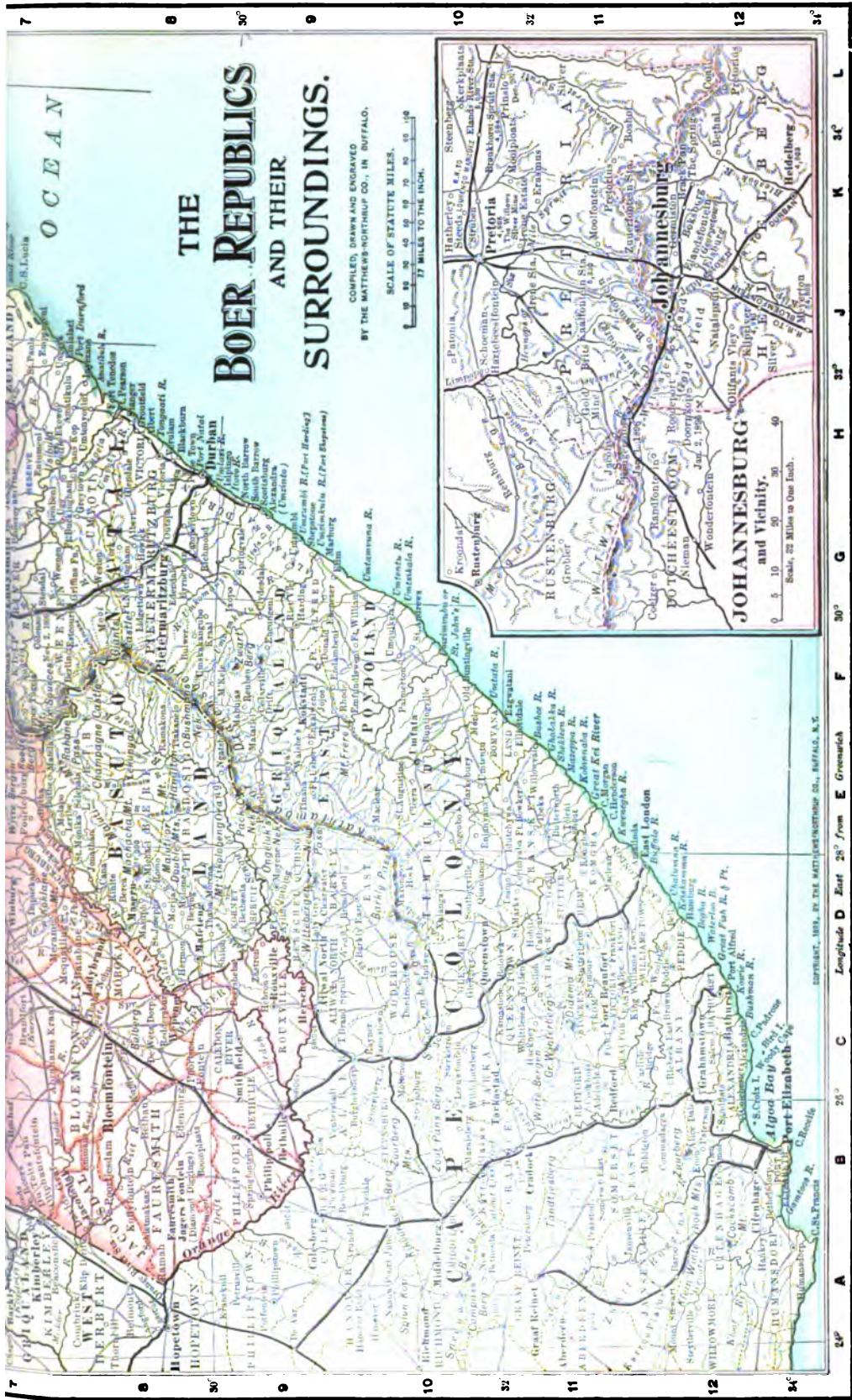
berlain sent to Sir Alfred Milner, for communication to the Pretoria government, a despatch stating that it was henceforth useless to discuss the question along the lines hitherto followed, and that the government "would consider the situation afresh and formulate its own proposals." To the unfriendly critics of Great Britain it seemed that the prolonging of the negotiations was wholly in the interest of that country, since it thereby gained time to make the necessary military preparations, while it was to the advantage of the Transvaal to force matters to an issue. Since a pacific settlement was impossible it seemed likely that the Boers would take the offensive. If they did so they would be only nominally the aggressors. It was thought that they would not only have the advantage of finding the English unprepared, but might stir up in their favor the Dutch elements in the population of South Africa. It was quite likely that the Dutch population of the Cape might take sides in the matter in spite of Mr. Schreiner's declared policy of neutrality. The Orange Free State was openly on the side of the Transvaal, and in a resolution of its legislature on September 27 declared that while it would strive to maintain peace it would aid the Transvaal in the event of war.

Continental View of the Affair.—The attitude of many continental writers toward the points at issue between the British and the South African governments is well illustrated by the remarks of a contributor to the *Revue des Deux Mondes*, of which the following is a summary: It is hard to tell whether Mr. Chamberlain or President Kruger has shown the greater ingeniousness and subtlety. Each submitted propositions and counter-propositions and held to them with equal firmness. After the cabinet meeting in London in the early part of September a firmer tone was taken by the British government and a sort of ultimatum was sent to the government at Pretoria. To President Kruger was given the alternative of a simple yes or no without the opportunity to submit any new counter-propositions. He would have done well if he had accepted the demands of England at once, since, according to this French writer, it is the practice of English diplomacy constantly to increase its demands as the negotiation is prolonged. This is what Mr. Chamberlain is charged with doing. He constantly shifted the ground of the debate, wearing out his adversary by new and unexpected demands, so that by the time President Kruger was ready to accept one set of propositions others had cropped up. He was thus in the absurd position of a man who yields always a little too late and brings himself to grant one concession only after a new one is demanded. President Kruger was always accepting the next to the last proposition. This singular operation continued until all of the propositions contained in Sir Alfred Milner's programme at Bloemfontein were conceded by the Transvaal government, but, in the meanwhile, an entirely new set of demands had come into being, and these the South African republic refused. For example, President Kruger objected for a long time to grant the Outlanders the electoral franchise after five years of residence. He ended by making this concession, but the situation had changed, and Mr. Chamberlain was no longer content with a mere adjustment of the electoral franchise qualifications. The question of the independence of the Transvaal came up. This, in the opinion of the writer for the *Revue*, "was the main point at issue from the first," but Mr. Chamberlain was afraid to bring it up until public opinion had been gradually accustomed to the situation. By wearing out the patience of the public by these prolonged negotiations, which were not wholly intelligible, and which could readily be imputed to the obstinacy of the Transvaal government, Mr. Chamberlain hoped to ripen the war feeling, which was the ultimate motive of his policy. He convinced the people that there was no other way of ending the matter, since President Kruger had shown himself so obdurate. In France a certain cynical praise greeted his success, which was there attributed in equal parts to skill and to unscrupulousness. He finally brought Mr. Kruger to the position of saying, in substance, "I grant you everything provided you recognize my independence," to which Mr. Chamberlain, with an assumption of impatience and irritation, declared that it was precisely the independence of the Transvaal which could not be granted. Afterward at his country house at Highbury he renewed his statements in still more energetic language, giving to the Transvaal government no alternative but submission. This view of the matter, though not borne out by a careful study of the correspondence, is worthy of notice on account of its prevalence among continental critics.

The Outbreak of War.—On October 9 the Boer ultimatum was handed to the British agent at Pretoria. It demanded the reference of the points in dispute to arbitration; the instant withdrawal of all British troops on the border and of all reinforcements that had been sent to South Africa since June 1; that no more troops should be landed in South Africa, and it declared in conclusion that, unless the British government should answer before 5 o'clock P.M. on October 11, the Boer government would with regret be compelled to regard the action as a declaration of war. The British government replied that these terms could not be discussed, and on October 10 the British agent was instructed to apply for his passport. On the following



The South African Republic, or Transvaal.
Capital, Pretoria. Area, 159,159 square miles.
Population, estimated 1,000,000 in 1905. No
more than 15,000 white, 100,000 of the whole
population are of European descent. The
population of the Orange Free State is
not more than 200,000 to 250,000 of whom a little
have been population. Capital, Bloem-
fontein. Area, 120,000 square miles. Popu-
lation, 1,750,000.
Capital, Cape Town. Area, 220,000
square miles. Population, 1,400,000.
Area, 1,750,000 square miles. Popu-
lation, 1,750,000.
Area, 1,750,000 square miles. Popu-
lation, 1,750,000.



day, the time stated in the ultimatum having expired, and the British agent at Pretoria having demanded his passport, war was declared. At this time the British forces were disposed as follows: The main body under General Sir George Stewart White, comprising about 15,000 men, was stretched across the frontier of Natal from Ladysmith to Dundee, holding well-intrenched positions. Another force, small in numbers but well equipped, was at North Aliwal on the Orange River, which at that point marks the boundary between Cape Colony and the Orange Free State. A third force was intrenched at Kimberley, on the western frontier of the Orange Free State; a fourth, under Colonel Baden-Powell, was at Mafeking on the Bechuanaland frontier, and a small local force was farther north on the Rhodesian frontier. The Boer forces at each of these points outnumbered the British, the numerical superiority of the Boers being the most marked at Mafeking. On October 12 the Free State troops occupied Philipstown in Cape Colony, and another body entered Natal through the Tintwa and Van Reenen's passes. On the same day occurred the attack of the Boers upon an armored train at Kraai-Pan, resulting in the wrecking of the train and the capture of an officer and 15 men, together with two guns. On the following day the British took up their position near Ladysmith, the Boers having previously occupied Laing's Nek and Ingogo Heights. On the same day the town of Vryburg on the Cape Town railway to the south of Mafeking surrendered to the Boers. On October 14 and 15 fighting occurred at Mafeking and Kimberley. At the former place the Boers destroyed one armored train, but were repulsed with heavy losses in an attack upon another. The engagement near Kimberley was unimportant, but resulted in the repulse of the Boers. In the meanwhile, on October 14, General Sir Redvers Buller with his staff left London for South Africa. During the next few days the Boers received reinforcements on the frontier of Natal, and on the 17th General Joubert reached Newcastle and assumed command of the forces in that region. On October 18 the House of Commons was requested to vote an addition of 35,000 men to the army, and of £10,000,000 to the military appropriation.

British Successes.—In the meantime several unimportant skirmishes took place at the seat of war, but the first engagement that could be reckoned at all serious occurred on October 20. On that day about 4000 Boers under Commandant General Joubert were defeated by the British under General Symons near Glencoe. The British plan was to attack the Boer advance in detail, and, upon learning that one of the Boer columns had seized Talana Hill overlooking the British camp at Glencoe, General Symons sent a column consisting of the Sixtieth Rifles and the Dublin Fusiliers to attack the position under cover of the British artillery fire. This order was gallantly executed, and the artillery, having been brought around the base of the hill in order to cut off the Boers from retreat, did considerable execution among the fugitives. The Boer loss was not known, but was reported to be heavy. General Symons was mortally wounded at Glencoe, and the British losses included 10 officers killed, 25 wounded, 30 non-commissioned officers and men killed and 164 wounded. The British lost also a squad of hussars, which, while pursuing the enemy, were surrounded and taken prisoners. The second action of the war occurred at Elands-laagte on the following day. General White, upon learning that a force of Boers had severed the railway communication between Ladysmith and Glencoe, made another attempt to attack the Boers in detail in order to restore this communication. A detachment sent out under Commandant General French was completely successful in this purpose, carrying out much the same tactics as in the previous engagement—that is, shelling the enemy's position and then attacking the heights which they occupied. The British success was greater than in the previous engagement, since 200 Boers were taken prisoners, together with two guns, some camp stores and a number of horses. The Boer losses in killed and wounded were variously reported, according to one statement being more than 100 killed and according to another 400 killed and wounded. The Boers lost their commanding general and other officers of high rank. The British loss was placed at 42 killed and 205 wounded. The third engagement took place at Rietfontein on October 24. This action occurred in covering the retreat of General Yule from Glencoe to Ladysmith, the former position having become untenable on account of the increasing numbers of the Boers. General White sent out a force to attack the division of the Boers which was on the west of the railway line, in order to prevent their interfering with General Yule's march. The British loss in killed and wounded was placed at about 100, the Boer loss was not known. On the same day occurred a sortie from Kimberley, resulting in a defeat of a force of 700 Boers by 500 British, and the bombardment of Mafeking was begun by the Boers. By October 26 General Yule had effected a junction with General White at Ladysmith.

British Reverses at Ladysmith.—General White planned to attack the Boer position on Monday, October 30, including as a feature of this operation the sending of a force during the previous night to turn the right flank of the Boers. The column sent out for this purpose comprised four and a half companies of the Gloucestershire

Regiment, six companies of the Royal Irish Fusiliers, and the Tenth Mountain Battery, all under the command of General Carleton. They were ordered to seize Nicholson's Nek. Starting out on Sunday night, they marched up a narrow valley running north from Ladysmith, but when about two miles from Nicholson's Nek the mules carrying the batteries and infantry ammunition were stampeded by rifle shots and the rolling of boulders, and the column thus lost its reserve ammunition. The troops then took up a position on a hill near the road, where they were attacked by superior numbers. They resisted bravely so long as ammunition held out, but early in the evening were obliged to surrender. It was reported that about 20 officers and men were killed, 100 wounded, and about 870 sent as prisoners to Pretoria. In his report of this disaster General White expressly declared that the blame for it rested on himself alone, and that the conduct of the troops had been excellent. It seems to have been the plan of General White to attack the Boers at once at three points, but in carrying out this movement it was found that at each of these points the enemy were stronger than had been supposed. The British were obliged to retire. During this engagement the British artillery fire was especially well managed and the Boer guns were repeatedly silenced. The Boers in their turn showed remarkable skill and courage, and the British losses were exceedingly heavy, being placed, according to some estimates, at 60 killed and 240 wounded. Heavy naval guns had been brought up from Durban, and were manned by blue-jackets. During October 31 and November 1 there was heavy artillery firing on both sides. On November 2 it was announced that the telegraph connection to the south of Ladysmith had been severed.

Change in Plan of Campaign.—For several weeks nothing was heard from Ladysmith except occasional rumors to the effect that the garrison was still holding out, and that the Boer artillery was doing very little damage. In the meanwhile, on November 1, General Buller had arrived at Cape Town. The original plan was to concentrate a large force on the southern boundary of the Orange Free State, but General White's detention at Ladysmith and the Boer raid in Natal changed the whole course of the campaign. It was decided that Ladysmith must be relieved, and the troops, upon arriving at Cape Town, were at once sent to Durban in Natal. Early in November 16,000 fighting men were thus diverted from the original object of the campaign. And while General Buller was accumulating a large force at Estcourt for this purpose, another force under General Gatacre was sent to Queenstown to check the invasion from the Free State into the northern part of Cape Colony, and a considerable force under Lord Methuen gathered near the Orange River preparatory to marching to the relief of Kimberley. In Natal the Boers showed great activity, and were raiding the country and doing what they could to surround the British forces, but the main interest of the campaign was now changed to the west, where Lord Methuen's operations near the Orange River resulted in some severe fighting.

Belmont and Modder River.—On November 23 Lord Methuen attacked the Boers in a strong position at Belmont, and repulsed them after a hard contested fight, in the course of which some 225 were killed and wounded on the British side. The next battle occurred at Graspan or Enslin on November 25, where some 3000 Boers were dislodged at the point of the bayonet. In this battle the British troops were aided by the naval brigade, which displayed great gallantry and suffered heavy losses. The general result was a gain of twenty-five miles in the march toward Kimberley, but a large force of Boers barred the way on the Modder River. Here occurred the sharpest battle that had thus far been fought during the war. On November 28, after having shelled the Boers' position with a portion of the artillery, Lord Methuen dispatched a force of infantry before daylight to attack the position. The Boers were intrenched in the Modder village and in an island, as well as along the banks of the river. The fighting lasted ten hours, and the British troops were without water or food. The Boers were forced to retire, but during the night received reinforcements and occupied a still stronger position. The British losses were very heavy, amounting to nearly 500 killed and wounded, and including many officers.

British Reverses.—The days following Lord Methuen's battle at the Modder River brought news of nothing but disaster to the British, and were regarded as one of the darkest chapters in British military history. In the first place, came the news from General Gatacre, who, as has been said, was operating in the northern part of Cape Colony to check the invasion from the Free State, that he had met with a serious reverse in an attack on Stormberg on December 10. His dispatch attributed the failure to the fact that he had been misled as to the enemy's position by his guides. According to the reports in the press, he seems to have intrusted his forces to the guidance of a single scout and to have conducted his march in the darkness. The distance was underestimated, and the enemy's position was not reached until daybreak. It was then found that this position was on the top of an inaccessible hill, from which there was no line of retreat except over nine miles of hilly ground, commanded for the most part by the Boer artillery. The result of this mistake was a comparatively small loss in killed and wounded, but of some 500 prisoners. Another reverse which was

reported about the same time was the failure of Lord Methuen at Magersfontein. He attempted to attack the enemy commanded by General Cronje, who had retired after the previous battle on the Modder. The Boers numbered some 12,000. The Highland Brigade, which led the attack, was compelled to withdraw upon encountering the heavy fire of the Boers, who were concealed in trenches. Many officers and men were killed, including General Wauchope. The loss inflicted upon the British was estimated at 1000, and they were compelled to retire. There was much criticism of the conduct of the campaign in this quarter. In the first place, it was said that the successes at Belmont and Graspan were won at too great a cost. Secondly, General Methuen was blamed for his inactivity at the Modder River, where, after achieving some successes, he remained for nearly two weeks without attempting to attack the already shaken enemy. In the third place, the reverse which befell the Highland Brigade was criticised as unnecessary. It seemed as if these troops had been sent into a trap which might have been known to exist. When news came that Sir Redvers Buller had taken the command of the force operating on the Tugela River for the relief of Ladysmith, it was hoped that a report of success would soon come from Natal. At first there were reports of successful skirmishes, and these were followed by rumors that Ladysmith had been relieved. But it was soon learned that the most serious reverse of all had befallen the British arms. General Buller, having found the Boer position opposite Colenso impregnable, was repulsed in an attack at that point with a loss of 1100 men killed, wounded or prisoners. The attempt had been made to force a passage of the river at the same time that a part of the troops tried to keep off the flank attack of the enemy. Despite the great gallantry shown by the attacking force the movement failed, owing to the superior position of the enemy and their excellent marksmanship. Great losses were caused by the enemy's sharpshooters. The general's despatch concluded with the words, "We have retired to our camp at Chieveley."

TRIASSIC FORMATION. The triassic formation assumes considerable importance in the Atlantic States, especially in the Connecticut Valley and in New Jersey. It consists of a series of sandstones and sandy shales, which have been deposited in shallow water and have been subsequently intruded by sheets of diabase. W. M. Davis has given considerable attention to those of the New England region, and those of New Jersey have been investigated by Russell, Darton, and others. Recently Kummel has made a somewhat detailed examination of the New Jersey occurrence. His results show that these beds (of the Newark formation, as they have been renamed in recent years) have been deposited in an estuary that extended across what is now northern New Jersey into New York, and that the material was sorted considerably by currents before it was laid down. The presence of raindrops, mud cracks, and ripple marks proves the shallowness of the estuary. Before the deposition of these materials had ceased great flows of lava took place, some of which came up through the soft mud in the bottom of the estuary. There were at least three periods of eruption, separated by long periods of quiet, during which the deposition of material in the estuary went on as before. Subsequently the whole formation was faulted. These facts also apply in general to the formation as seen in the Connecticut Valley.

TRINIDAD and TOBAGO, West Indian islands, lying off the Venezuelan coast, north of the Orinoco delta, constitute a British crown colony. Tobago was included in the government of the Windward Islands up to 1889, when it was annexed to Trinidad, and on January 1, 1899, it became a ward of the latter island. The area of Trinidad is 1754 square miles, and of Tobago, 114 square miles; their estimated populations are 260,000 and about 20,800 respectively. The capital and seat of government is Port of Spain, with a population upward of 34,000; other towns in Trinidad are San Fernando (population, 6570); Princetown (population, 4197), and Arima (population, 3653). There are two towns in Tobago, Scarborough (population, 1370), and Plymouth. The government is directed by a governor, Sir Hubert E. H. Jerminham, K.C.M.G., since January, 1897, who is assisted by an executive council of 7 official members and a legislative council of 9 official and 11 unofficial members, all of whom are nominated by the crown. For Tobago there is a subordinate commissioner. Public schools, numbering 196, and having about 24,000 pupils, receive government grants; in addition, there are private schools, a Roman Catholic college, with about 200 students, and a Queen's royal college, with about 100 students. The public debt in 1898 was £911,211. Other statistics of finance and statistics of commerce for the two islands have been:

	Revenue.	Expenditure.	Imports.	Exports.
1896.....	£586,462	£568,968	£2,477,457	£2,176,585
1897.....	575,265	587,414	2,172,886	1,999,607
1898.....	615,372	640,952	2,283,056	2,310,133

The aggregate shipping (foreign trade) entered and cleared in 1897 was 1,340,000 tons. In Trinidad the following acreages are given to the various important crops: Coffee and cacao, 99,500; sugar-cane, 57,000; cocoanuts, 14,000; ground provisions, 13,500; and 10,000 acres are pasture. The cacao export from this island in 1897 was valued at £605,690; sugar, £537,107; molasses, £16,991. The chief exports in 1898 were: Cacao, 28,196,224 pounds; sugar, 113,578,304 pounds; molasses, 660,535 gallons; rum, 86,513 gallons; bitters, 33,989 gallons. Other products are cocoanuts, timber, and fruits. A pitch lake of 110 acres, near the village of La Brea, containing an immense supply, yielded in 1898 an export of 100,208 tons, valued at £113,820. In 1897 Trinidad imported textiles valued at £309,611; flour, £127,383; rice, £148,777. There are 84 miles of railway and 690 miles of telegraph lines. Pursuant to the Colonial Loans acts in 1899 the imperial government advanced £110,000 for the development of the resources of the island. On September 10, 1898, a hurricane did much damage in the islands.

TRIPOLI, a Turkish province, lies in northern Africa on the Mediterranean, between Tunis and Egypt, with a coast-line of about 900 miles, an area of 410,000 square miles, and a population estimated at 1,300,000, contained within the four provinces of Khoms, Jabel-el-Sharb, Fezzan, and Benghazi. There is a military force of about 10,000 men in the province. The revenue is mainly raised by a poll-tax, the size of which grows with the wealth of the person taxed, and by tithes. The coast region is fertile, and produces tropical fruits, grain, wine, cotton, madder, which with ostrich feathers, ivory, skins, sponges, hides, and live stock, form the exports. The imports are manufactures, tea, wines and spirits, and articles for barter in the interior. Away from the coast the country is less productive, and the rainfall is light. The country contains many ancient ruins, notably at Cyrene, Ptolemais, Apollonia, and Leptis.

TROPICAL DISEASES, STUDY OF. During 1899, schools for the study of tropical diseases have been founded in Edinburgh and Liverpool. Germany has always produced men who investigate diligently the diseases of her tropical colonies, as well as those of Brazil, Mexico, Java, and Borneo. Our new tropical possessions will make it necessary for the United States to undertake actively an investigation of tropical diseases. New York University established, a few years ago, a professorship of tropical diseases, and called to the chair Professor J. E. Stubbert, physician-in-charge of the Loomis Sanitarium for Tuberculosis, at Liberty, N. Y. If American universities, with the help of the government, will endow chairs for the proper investigation of tropical diseases, this country can train and send forth to Cuba, Puerto Rico, Hawaii, the Philippines, and Guam well-equipped scientists whose researches may take rank with Koch's discovery of the cholera-germ in India, and his researches regarding rinderpest in Africa, with Ross and Manson's discoveries regarding malaria, as well as with Manson's researches regarding sleeping sickness in West Africa. A college has been founded at Witzenhausen, Germany, for the study of tropical problems, supposedly to include medical subjects. The German federal government, acting on a proposition of Professor Robert Koch, has decided to erect in Hamburg an institute for research in tropical diseases. It is said that this city was chosen in place of Berlin on account of its harbor, whence sick sailors and passengers can be brought directly to the institute without railway travelling. There are to be 30 beds in the establishment.

TROPICAL FEVER. A very common fever in the Philippine Islands is tropical fever, also called calentura. It has the latter name in Cuba, where it is also termed Cuban fever. It is said to begin without any prodromal symptoms, a chill and rise of temperature to about 103° ushering in the disease. The temperature is likely to rise higher; muscular pains supervene, with headache, loss of appetite, nausea, and marked weakness. Cases as a rule recover spontaneously in a week. Quinine proves of no efficacy. A preliminary dose of calomel, followed by a saline cathartic, and subsequent administration of large doses of tincture of aconite for a few days, shorten the attack.

TRURO, Baron, THOMAS MONTAGUE MORRISON WILDE, died March 8, 1899. He was born March 11, 1856, was admitted to the bar in the Inner Temple, London, in 1878, and succeeded his uncle to the title in 1891. He was the third and last Baron Truro.

TRUSTS. The great increase in the number and extent of industrial combinations in 1898 and 1899 gave special prominence in the latter year to what was known as the trust problem. There was evidence in many quarters of a strong determination to check the spread of such combinations and to restrain those which were already in existence. The attempt was made to bring the trust question into national politics, and make it a campaign issue. (See UNITED STATES.) One estimate, formed early in 1899, places the number of trusts at 353, and reckons the increase in the year as

75 per cent. Combination in industries and concentration of capital continued during the year. There was a renewed effort on the part of several States to legislate against them, and in many States, especially in the West and South, the rigorous enforcement of existing laws led to the withdrawal of some corporations and the reduction of capital in the case of others. New Jersey was regarded with especial disfavor by the opponents of trusts on account of the facilities offered by its laws for the formation of these combinations. The number of companies incorporated in New Jersey in 1898 was 1103, and the State has won for itself the nickname of the "home of corporations." In Texas the anti-trust spirit showed itself by the rigorous enforcement of penalties upon corporations for the non-payment of their franchise taxes; by the refusal to allow corporations chartered under New Jersey laws to do business within the State, and by an act of the legislature against all unions or combinations aiming at the regulation of prices, such unions or combinations being regarded as conspiracies under the law. A similar act was passed in Michigan, but with heavier penalties for violation. The members of such combinations were not only subject to fines and forfeitures, but were liable to imprisonment, and any person injured in his business by the combination was authorized to bring suit for twice the amount of damages sustained. Among the important decisions of the courts the following may be mentioned: In Arkansas the supreme court declared the Arkansas law against trusts unconstitutional in so far as it applied to combinations formed outside the State (May 7). In Indiana the supreme court decided on June 6 that any combination on the part of combinations for the purpose of fixing prices or limiting production rendered them liable to a forfeiture of franchise, and the supreme court of Illinois rendered a similar decision on October 19, holding that such a combination to fix prices was a conspiracy to defraud. In Kentucky a combination of insurance companies to maintain rates was decided by the court of appeals on June 15 not to be an indictable offence, and the New Jersey supreme court held that a corporation might legally compel the concerns which they had bought up to abstain from competition in the business. On December 4 the United States Supreme Court held that an agreement between the Addyston Pipe and Steel Company and five other companies to divide the territory of the United States and keep prices affected interstate commerce and was illegal. Two important public conferences to discuss trusts were held in 1899. The first, which met at Chicago September 13-16, comprised delegates from 30 States and from various trades organizations. Among its members were several prominent economists and many political leaders. The conference refrained from taking sides with any political party, and passed no resolutions. A great variety of views was expressed, ranging all the way from the conservative statement of students of economics that the data at hand were not yet sufficient to warrant any definite conclusions in regard to the effects of trusts upon prices, to the extreme denunciation of trusts as altogether bad and as the certain forerunners of industrial slavery. The defence of trusts by Hon. Bourke Cockran and the criticism of them by Hon. W. J. Bryan attracted more attention than any other features of the conference. The general points of agreement brought out in the course of the discussion were that trusts could be best dealt with if kept clear of partisan politics; that government should not discriminate in their favor, and that they were a possible menace to industrial welfare. The other conference was held at St. Louis, September 20-21. It was composed of the governors and attorneys-general of eleven States. It was distinctly anti-trust in character and passed resolutions recommending legislative action. Among its suggestions were: A clear definition of contracts in restraint of trade; a requirement of full public reports from corporations, whether chartered in the State or not; the denial to any corporation of the right to hold stock in another corporation engaged in a similar or competitive business; and the rendering of shareholders liable to twice the face value of their stock whenever stock is issued beyond the amount of paid-in capital. A conference on the subject of trusts which attracted less public attention but which produced more valuable results than either of these took place at the meeting of the American Economic Association, December 27-29. For a brief account of the discussion, see the article *ECONOMIC ASSOCIATION, AMERICAN*. For further information in regard to anti-trust legislation, see the separate articles on the States.

TUBERCULOSIS. *Statistics.*—Statistics regarding a disease are compiled slowly, and but local or fragmentary reports are published so as to be accessible at the end of the year. Early in 1899 a report by Dr. A. R. Guerard was presented to the Senate Commission on Tuberculosis of the State of New York, regarding the spread of tuberculosis in the crowded tenement portion of New York City. He finds that out of 71,828 dwellings in New York City, deaths from tuberculosis have occurred in 18,771, or about 23 per cent. during the past 5 years. In 14,479 houses there have been 15,511 deaths from this disease in one year. In the old fourth ward there are 663 houses, sheltering 18,323 persons; and in 248 of these houses there have been 541 cases of tuberculosis in 3 years. In the old sixth ward there are 630

houses, sheltering 22,897 persons; and 465 cases of tuberculosis were reported in this ward. Continued recurrence of the disease is reported in many houses. A summary made for 5 years of the entire city is as follows:

Total number of dwellings in New York City.....	81,828
Number of dwellings in which there were deaths from tuberculosis.....	18,771
Percentage on total.....	22.94
Houses with deaths in one year.....	14,479
Total deaths in same.....	15,511
Deaths per house.....	1.07
Houses with deaths in more than one year.....	4,292
Total deaths in same.....	11,232
Deaths per house.....	2.61

It was reported by Dr. T. W. Grimshaw, the registrar-general for Ireland, at the meeting held June 30, 1899, in Dublin, in the interest of an anti-tuberculosis crusade, that from 1871 to 1880, 10 per cent., and that from 1881 to 1890, 11 per cent. of all the deaths in Ireland were due to tuberculosis in some form. In Great Britain 70,000 deaths are attributed annually to tuberculosis, but the ratio is not increasing, and population is not decreasing as it is in Ireland.

Congress.—The International Tuberculosis Congress, promoted by the central German committee for the establishment of sanitariums for pulmonary diseases, was held in Berlin, Germany, May 24-27, 1899. Of the 2000 present, 112 were delegates from foreign countries, including the United States. The Congress was held under the patronage of the German Empress; the Duke of Ratibor and Professor von Leyden were the presidents, and Prince Hohenlohe, the imperial chancellor, was honorary president. The following subjects were discussed: (1) Dissemination of Tuberculosis, (2) etiology, (3) prophylaxis, (4) therapeutics, and (5) sanitariums.

Infection and Primary Lesions.—G. Cornet, of Berlin, published in 1899 the results of several experiments made with dried sputa of tubercular patients, the results of which controvert the assertions of Flügge. Flügge asserts that the disease is spread by moist particles expelled from the respiratory tract during coughing and speaking, and denies that infection is caused by dry sputum. Cornet scattered some dry sputum over a rug on the floor of a room. Twelve guinea pigs were placed so as to inhale this sputum. Twenty-four pigs were placed in a wooden cage so arranged in four groups that each group of six could be kept at a different level from the floor, the rug being directly in front of the cage. The rug was then swept vigorously with a broom, raising dust that the animals inhaled. Twelve pigs were placed in an open cage three metres from the rug, and one-half metre above the floor. All but one of the 48 animals became tuberculous, those in the first series showing the most extensive lesions. The animals in the second series suffered more than in the last, and their lesions varied inversely with the distance from the floor. Some of the animals were obliged to breathe through the mouth. Of these one-half acquired tuberculous lesions in the cervical glands and also more marked general lesions. But one-fifth of those which breathed through the nose had such lesions. Weaver found that in the majority of human cases the primary lesion occurred in the posterior portion of the lung apex, which fact he considers due to the discharge of infected chyle into the vena cava. Should the apex of the lung be healthy and resistive, the tubercle bacilli will pass on to some vulnerable spot in another area, unless the blood has exerted its bactericidal power over them. Trudeau, of Saranac Lake, N. Y., believes that adenoid growths in the nasal fossæ are very frequently the primary channels of infection. He has studied the problems of individual or racial predisposition. He finds chickens are highly susceptible to infection with the avian tubercle bacillus, while resisting inoculation with the bovine or the human tubercle bacillus. On the other hand, the guinea pig succumbs readily to infection from the human bacillus, and still more readily to the bovine bacillus, but resists infection with the avian variety. The rabbit, on the contrary, is killed by all these forms.

Prevention and Notification.—D. S. Davies, in the *British Medical Journal*, April, 1899, discusses the great importance of the question of the spread of tuberculosis through the medium of infected dwellings. The dissemination through food is of common occurrence. He urges a thorough inspection of all slaughter-houses, proper inspection of dairies with notification of all udder diseases in cows, the extension of legal powers with regard to the exclusion of tuberculous cows from any district, the examination of samples of milk and the inspection of cow-sheds. Davies recommends registration, apart from the general notification, of all cases of the disease in man.

Arthur Newsholme, in the *London Lancet*, in February, 1899, says that the prevention of tuberculosis must have regard to the disposition of the infectious discharges from the patient, especially his desiccated sputa, and the personal and environmental conditions which favor the origin of phthisis. He favors voluntary isolation of the patient in some sanitarium or the removal from his home of relatives who are apt to fall victims to the disease. Newsholme regards the notification of the disease to the medical officer as the best means of prevention of its spread, as this course leads to inspection of the premises and the ordering of remedial measures against spread of infection during the disease and for disinfection after death. It is the custom in many of the English towns to send by mail a circular to the head of the house in which a death from tuberculosis has occurred giving directions, this circular being followed by an inspector in a few days, to ascertain if directions have been followed. The text of the circular is as follows:

"1. Strip the wall-paper from the wall. The paper should afterward be burnt in the fireplace of the same room.

"N.B.—The chief danger is from dust. Hence all articles should be thoroughly wetted before cleansing them. A supply of disinfectant for mixing with the water can be obtained free of cost at the office of the town hall, but a disinfectant is not essential if everything is thoroughly wetted.

"2. Thoroughly wash the ceilings and floors and walls of the room.

"3. Wash all bed-linen and other articles in the room, and expose all bedding, pillows, etc., out of doors for several hours in bright sunshine."

For the past 5 years fatal tuberculous disease in England has been recorded in full, inquiry being made under the following heads:

"Deaths from tuberculous diseases—sex, age, disease, address, name of doctor, date of death, duration of illness, source of milk-supply, places of residence during illness, nature of occupation during the last 10 years, other cases of allied disease in the family, previous history of the house.

"Condition of the house as regards (1) overcrowding, number of occupants (over 10, under 10), number of living-rooms and bedrooms; (2) whether animals are kept; (3) condition as to dampness, condition as to cleanliness; (4) ventilation; (5) lighting; (6) drainage arrangements; (7) dust-bin; (8) size of yard, condition of paving."

On June 10, 1899, in the State of Washington, a law went into effect requiring physicians to report to local boards of health in cities of the first and second classes all cases of tuberculosis, giving name, age, sex, occupation, and residence, within five days of seeing the case for the first time. The board of health is required to furnish to the patient or the head of his family printed instructions for the prevention of communication of the disease. The law contains further provisions and penalties. A similar law has been in effect in Buffalo, N. Y., for five years, and also in New York City for nearly as long. In the latter city a circular requesting notification of cases in private practice and directing cases arising in dispensary and hospital practice was issued from the board of health, February 23, 1894.

The government of South Australia adopted a compulsory notification act, which took effect January 4, 1899, providing that "every medical practitioner attending on, or consulted by, any person suffering from pulmonary tuberculosis shall, as soon as the fact becomes known to him, report the same to the local board of the district in which the person resides." Disinfection is to be made at the discretion of the medical attendant or the health officer. Provision is made for the inspection of cattle and meat, and the destruction of tuberculous cattle.

What is known as the "Infectious Diseases Notification Extension Act" of 1899 will go into force in England and Wales at the close of the year mentioned. It was found that 28,000,000 of England's 29,000,000 population were governed by local acts of Parliament for certain towns, regulating the spread of infection. The new act is expected to supersede those now in existence and impart a uniformity to the system of notification.

During the latter months of 1899, action was taken by the California State board of health to set a date for the discussion of the propriety or advisability of certain proposed measures, looking toward quarantining tuberculosis. Mistaken zeal on the part of newspaper correspondents and groundless fear led to a prevailing idea that tuberculous patients were hereafter to be forbidden to enter the State. Such a measure as this was not considered.

Treatment.—Dr. Vincenzo Cervello, professor of pharmacology in the University of Palermo, Italy, has published reports on 26 cases of undoubted pulmonary tuberculosis which he commenced treating with inhalations of a formalin mixture in January. In 19 of these cases there was a return to the normal temperature, a cessation of the cough and the characteristic râles, and a disappearance of the bacilli from the sputa. Finally 10 of these were decided to be cured, 3 were distinctly improved, 2 remained in stationary condition, and 2 died. Signor Florio, a Palermitan

banker, has given \$1,000,000, with which an ample sanitarium has been equipped on the model of the Paris Pasteur Institute, to continue Cervello's experiments. At the Loomis Sanitarium, Liberty, N. Y., a new drug, kalagua, has been used during 1899, in 21 cases with an apparent cure in 5 per cent., improvement in 62 per cent., stationary condition in 14 per cent., while 19 per cent. grew worse under the treatment. Kalagua is a plant brought from Colombia, South America. It is reported that its antitubercle properties were first discovered through the cure of tuberculous cattle which ate its leaves. Experiments show that it is not toxic for dogs, rabbits, or horses, and that it has antiseptic power. Small doses soon saturate the patient, as shown by the presence of its odor in the breath, the urine, and the perspiration. The majority of the incipient cases at the Loomis Sanitarium have been treated with antitubercle serum with satisfactory results. (Incipient cases are defined to be "those in which there is slight localized involvement of the lung, with little or no constitutional disturbances.") Of these cases thus treated, 31 per cent. were apparently cured, 44 per cent. improved, 17 per cent. remained stationary, while 8 per cent. grew worse. The nitrogen gas compression treatment, so vaunted in certain sections of this country, consisting of introducing nitrogen into the pleural cavity, seemed of use only in cases of hæmoptysis, and in these it relieved this one symptom.

All authorities and experimental clinicians agree in urging and commending the open-air treatment—absolute life in the open air for a number of years. Exposure to fresh air, abundant dietary, freedom from all excitement, with repose of mind as well as of body, exercise suited to the strength and requirements of the patient, and careful medical supervision of every detail of the invalid's daily life are the principles of the ideal care of a tubercular patient. For those who can afford it, sanitarium treatment is the only treatment worth considering, in Europe or America. In choosing a resort, it must be remembered that there is no one place suitable for all cases, and that frequently patients make most headway by spending part of the year in one place, part in another. Osler, of Philadelphia, suggests in the *British Medical Journal* for October, 1899, for those who cannot leave home for a sanitarium—about 90 per cent. of the cases—that much can be done for them in the way of a fixed number of hours daily in the fresh air, on the veranda, on a sofa in the garden, or in a bright room with the windows wide open, resting as long as fever is present, and using a well-regulated diet.

Societies for the Prevention of Consumption.—The British National Association for the Prevention of Consumption has succeeded in arousing public sentiment and implanting the conviction that tuberculosis is infectious. The society is now engaged in allaying the fears of the public that founding sanitariums for the open-air treatment of tuberculosis is fraught with danger to the immediate community. On July 7, 1899, a league to combat tuberculosis was founded in the Argentine Republic, where 8000 persons die of tuberculosis annually. In December it was reported in the *British Medical Journal* that a league against tuberculosis was being organized in Spain. In the summer of 1899 the Illinois Society for the Prevention of Consumption was formed, and has begun crusaders' work. The special inspection of milk will be urged and the State will be requested to erect a State sanitarium for tuberculous patients. The people will be educated by means of pamphlets in the matter of infection and the spread of the disease among cattle and human beings. The compulsory isolation of consumptives in virulent stages will be sought through legislation now contemplated.

Special Hospitals and State Care.—The most promising prophylactic measure in the care of tubercular patients will be the erection of State and municipal sanitariums in proper localities for the treatment of incipient cases, and the establishment of special hospitals in large cities for the shelter of advanced or hopeless cases. The Massachusetts State Hospital for Tuberculosis reports excellent figures for 1899. The citizens' committee of Chicago that undertook to aid in the acquisition of \$150,000 for a special building for tuberculous patients under the auspices of the Sisters of St. Elizabeth Hospital, secured \$10,000 in November. The projected building will care for 300 patients. The National Jewish Home for Consumptives, erected in Denver, Col., by the Order of B'rith, was formally dedicated early in December. In the latter part of the year a sanitarium was established at Fort Bayard, N. M., for the treatment of officers and enlisted men in the United States Army suffering with tuberculosis. The climate is praised as dry and equable. The elevation is 6000 feet above tide.

A bill was passed by the New York legislature in April, 1899, providing that hospitals for the treatment of pulmonary tuberculosis may be established by any municipal corporation having a population of 250,000 or more inhabitants, outside of its corporate limits, and not within the corporate limits of any other municipal corporation. Sites shall be selected by boards of health, and the municipality in question may acquire title to lands for the purpose. Early in the autumn the State

board of health took action upon this legislation, toward the establishment of proper hospitals. It was hoped that during the session of the legislature in 1900, in accordance with a special committee's report, a State sanitarium would be established in the Adirondack Mountains, on the forest preserve already belonging to the State. It was suggested that the accommodations should be for at least 200 patients, and that those unable to pay should be cared for at the expense of the State.

Zoological Distribution of Tuberculosis.—At the 1899 meeting of the Zoological Society of London, a paper was read, founded mainly on observations made in the society's gardens. Of 215 necropsies made during the previous 6 months, 49 of the mammals and birds presented lesions of tuberculosis. The ruminants and gallinæ suffered the most, the carnivores and raptores the least. Race and family seemed to exert little influence upon susceptibility to the disease and mode of housing a small amount, while food and food-habits seemed largely responsible.

Medico-legal Aspects of Tuberculosis.—The following story is taken from the *Philadelphia Medical Journal* of April 1, 1899: "At the local county court of Folkestone, the well-known Kentish port, a case was recently decided by the stipendiary judge of considerable importance to medical men and to the public at large, and more particularly to hotel-keepers. A gentleman died in one of the fashionable hotels last October on his way back from Cannes. He died of phthisis, and the medical man who signed a death-certificate to this effect advised that the furniture of the room occupied by the deceased should be disinfected, and the bedding destroyed. The estimated cost of this procedure—namely, £19 13s. 6d. (\$100)—was claimed by the hotel from the executors, but the claim was disputed on the ground that the measures of disinfection had not been carried out, certain furniture not having been destroyed, the wall-paper not having been stripped off, and the wood-work not having been repainted. The hotel authorities then amended their claim, and asked a sum equivalent to the rent of the room for a month, during which time it was stated to have been left unoccupied after disinfection; at the same time they disputed the diagnosis of tuberculosis. The judge refused to go behind the medical certificate, and disallowed all claim for repayment by the executors, except 15s., which sum the hotel proprietors were able to prove had been spent in fumigation, etc. The case is the first of the sort in England, and proves how widely the doctrine that phthisis is infectious is now held. The decision so seriously affects the interests of hotel-keepers that it is sure not to remain long unchallenged." See INSECTS AND THE PROPAGATION OF DISEASE; MARRIAGE, MEDICAL CONTROL OF; MILK; SERUM AND SERUM THERAPY; VITAL STATISTICS.

TUNIS, a French dependency since 1882, lying on the Mediterranean coast between Algeria and Tripoli, has an area of 50,000 square miles, and a population of 1,700,000, including 27,000 Frenchmen. It is nominally under the dominion of the bey, but France administers the country and collects the taxes, and there is a special department for Tunisian affairs in the French foreign office. French dominion has been confirmed by all the powers. The country is surrounded by French territory excepting Tripoli on the East, and recent events have made it appear that France wishes to obtain certain portions of that country, including several important oases in the Sahara. The capital, Tunis, has a population of about 153,000, and includes Moors, Arabs, negroes, Jews, and about 40,000 Europeans. It has a considerable number of manufactures in silk and woollen stuffs, shawls, carpets, fez caps, attar of roses, etc. The chief exports include grain, oil, cattle, wine, sponges, and esparto-grass. There are about 900 miles of railway and over 2000 miles of telegraph line. The city of Tunis is an interesting town, and contains the Great Mosque, and the bey's palace, which is a building of Oriental gorgeousness.

TUNNELS. The most important railway tunnel now actually under construction anywhere in the world is the Simplon Tunnel, through the Simplon Alps, between Italy and Switzerland. This tunnel when completed will be 12.2 miles in length; at the end of 1899 about 2½ miles had been excavated. At the highest point in its grade, which is near the centre, the Simplon Tunnel is 2313 feet above the sea level, and the depth of the mountain over the tunnel at this point is 7003 feet. When completed the tunnel will consist of two parallel tunnels, each accommodating a single track railway line, but at the present only one of these is being excavated to its full size. On the line of the other a small gallery is being excavated, which will be employed to convey material to and from the full-size excavation, to supply ventilation, etc. Afterward, if the traffic warrants it, this gallery will be enlarged to the full size necessary for railway use. The total cost of the single tunnel and gallery now under way is estimated at \$11,764,000. It is estimated that the completion of the gallery excavation with the necessary collateral work will bring the total cost of the double tunnel line up to \$15,000,000, or about \$1,230,000 per mile.

The Tarchino Tunnel, in Italy, on the lately completed railroad connecting Genoa,

Orada, and Asti, pierces the Apenines, and is 21,084 feet long. This railway is only 60.7 miles long, but has an aggregate of 16.1 miles of tunnels. The tunnel is double track, with a full centre arch of 13.12 feet radius; is 25.25 feet wide at the level of the rails, and 19.7 feet high in the clear at the centre. It was driven through alternating strata of calcareous schists and clay.

Among the more notable railway tunnels under construction in America are the following: Point Richmond Tunnel, San Francisco and San Joaquin Valley Railroad, California, 800 feet long, with a section 30x26 feet. The very large section is a notable feature of this tunnel. This same road has other tunnels under construction which have the following lengths: 5600 feet, 1300 feet, 1100 feet and 300 feet. The Baltimore and Ohio Railroad is building two tunnels, one 1600 feet and the other 1800 feet long, on its new cut-off between Whitehall and Thomas stations, near Pittsburg, Penn. A novel tunnel on the Golden Circle Railway, in Colorado, consists of a covered way made of steel I-beams, curved to the requisite arch form and filled between with brickwork to form the roof and sides. This covered way runs through the dumping grounds of the Portland Mine, Cripple Creek mining district, and will ultimately be covered by the dumpings from the mine. One railway tunnel, the Busk-Ivanhoe Tunnel, on the Colorado Midland Railroad, was abandoned in 1899. This tunnel was completed in 1892-93 and is 9395 feet long. It replaced a line of railway over the Haguman Pass, which has been again put in operation.

Submarine tunnel work during 1899 comprised as its chief example the Thames River tunnels for rapid transit in London, the water-works tunnels at Cleveland, O., and Chicago, Ill. (see WATER-WORKS), and several projected tunnels under the East River in New York City, under the Irish Channel, and under the Hoogly River, in Calcutta, India. The Irish Channel Tunnel is an old scheme revived, and to carry it out would require a tunnel between 25 and 30 miles long, to be excavated under about 80 fathoms of water. It is projected for railway use. The projected tunnel under the Hoogly River is 6875 feet long, of which 1290 feet under the river proper would be under a depth of 36 feet of water. The tunnel would consist of two parallel iron-lined cylinders, 17 feet in diameter, spaced 16 feet apart. Of the projected East River tunnels the most important are the Long Island Railroad Tunnel extension from Brooklyn to Manhattan, and the South Brooklyn Tunnel, extending from Whitehall Street, Manhattan, to Hamilton Avenue, Brooklyn. Plans have been completed for the Long Island Railroad Tunnel, but the South Brooklyn Tunnel has not yet been surveyed. Including approaches, the Long Island Railroad Tunnel would be about 15,000 feet long, and would carry two lines of track. It is estimated to cost about \$6,000,000, including three tunnel stations. During 1899 the partly completed Hudson River Tunnel at New York City was sold under foreclosure proceedings. Work was abandoned on this tunnel in 1892, after \$4,000,000 had been expended in excavating some 4600 feet, out of the total 27,000 feet of tunnelling required to complete its work as projected. See RAPID TRANSIT (paragraph Underground Railways); WATER-WORKS.

TURINI, GIOVANNI, sculptor, died in New York City, August 27, 1899. He was born near Verona, Italy, May 23, 1841; he studied sculpture at Milan and Rome, and subsequently was a professor at Milan. He was a volunteer in the Fourth Regiment of Garibaldi's army in 1866, and the following year he came to New York, where he had thereafter a studio. Turini's name recently came before the public in connection with difficulties between him and the Venezuelan government; he made for the latter several statues, for which he was to receive about \$75,000, and for which he did receive only \$8000, an amount said to cover only about half of the cost of the preliminary work. The matter was finally laid before the secretary of state at Washington, and it was reported in May, 1899, that favorable action would soon be taken by Venezuela. Among Turini's works are the group "Angelica and Medoro;" a bust of Pope Leo XIII., which is now in the Vatican; a colossal bust of Mazzini; the statue of Garibaldi, now in Washington Square, New York; the equestrian statue of General Bolivar, in Central Park, New York. Just before his death Turini was engaged upon a statue for the temporary Dewey Arch, erected at Fifth Avenue and Twenty-fourth Street, New York, in celebration of the victories of the Spanish-American war and the return of Admiral Dewey to this country.

TURKEY, or the **OTTOMAN EMPIRE**, embraces a large amount of territory in Europe, Asia, and Africa, a distinction being drawn between Turkey proper, which is governed directly by the Sultan, and several dependent and tributary states. The head of the Turkish government is the Sultan, Abdul Hamid II., who has complete and absolute monarchical power, in so far as he does not oppose the authority of the Koran. The legislative and executive powers are under him administered by the Grand Vizier and the Sheik-ul-Islam, the former being chief of the temporal and the latter of the religious government. The former is assisted by twelve ministers. The

country is divided for purposes of administration into thirty vilayets, which are again divided into sanjaks (provinces), districts, sub-districts, and communities. The area of the whole empire is estimated to be, in Europe, 62,744 square miles, with 5,711,000 inhabitants; in Asia, 650,097 square miles, with 16,823,500 inhabitants; in Africa, 398,900 square miles, with 1,300,000 inhabitants; total, 1,111,741 square miles, with 23,834,500 inhabitants. The other possessions or dependencies of the Ottoman Empire are Bulgaria (with eastern Roumelia), having 37,860 square miles and a population of 3,309,816; Bosnia, Herzegovina, and Novibazar, with 23,570 square miles and a population of 1,568,092; Crete, with 3326 square miles and a population of 294,190; Samos, with 180 square miles and 49,733 inhabitants, and Egypt, with 400,000 square miles and a population of 9,734,405. The total estimated area and population, including tributary states and dependencies accordingly, is 1,576,677 square miles and 38,790,736 inhabitants. The population of European Turkey is largely made up of Turks, Greeks, and Albanians, while there are many other races represented. The chief city is the capital, Constantinople, with a population in 1885 of 873,565. The present estimated population is not considerably larger. Other large cities are the following, the estimated population being given in each case: Smyrna, 200,000; Damascus and Salonica, each 150,000; Bagdad, 145,000; Aleppo, 127,000; Beyrout, 120,000.

Army and Navy.—All Mohammedans between 20 and 40 years of age are liable to military duty. Those not Mohammedan are not obliged to serve, but to pay each a tax of about \$1.50, irrespective of age. There is no little evasion of service on the part of the Mohammedan population among the nomadic Arabs and Kurds. The Martini-Peabody rifle is used by the infantry. A large number of Mauser rifles have been bought, but at the time of the latest reports had not been supplied to the troops. The total war footing of the regular army is: Infantry, 583,200 men; artillery, 54,720 men; cavalry, 55,300 men, and engineers, 7400 men; total, 700,620 men. Including reserves, etc., the total war footing in 1897 amounted to about 900,000 men. Information regarding the Turkish navy is not readily accessible, and such figures as are given are on the whole, it is said, too favorable. According to the *Statesman's Year Book*, there is no evidence of any definite building programme. Most of the vessels of the present fleet are of such small displacement or were built so long ago as to be largely inefficient, except for minor local defence.

Finance.—The budget for the fiscal year ending February 28, 1898, was: Expenditures, 18,429,411 Turkish pounds, and revenues, 18,511,322 Turkish pounds. The chief sources of revenue were tithes, land and property taxes, customs, taxes on salt, tobacco, spirits, etc., and various tribute revenues. The largest item of expenditure was for war, 4,489,698 Turkish pounds. The value of the Turkish pound in United States currency is about \$4.40. In 1898 the Turkish national debt amounted to £128,350,917.

Religion and Education.—The national religion is Mohammedanism, which prevails almost entirely in Asiatic Turkey, but in European Turkey only with about one-half of the population. Seven other creeds are tolerated by the Sultan, among them Roman and Protestant Christian, Greek, Armenian, and Jewish forms of worship. The number of Christians has been estimated at about 5,000,000. There are 2120 mosques in the empire and 11,600 ecclesiastics. Free public education is recommended by the Koran, which is the source of all Turkish law, and there are 1780 elementary schools and a number of colleges (medresses) connected with the mosques where education is given.

Commerce, etc.—The latest official reports concerning the exports from and imports into Turkey are for the year 1894-95. The total exports were valued at \$60,516,743, and the total imports were valued at \$105,932,154. The greatest amount of foreign trade is with England, the exports to that country amounting to \$26,197,223, and the imports, \$40,986,987. France and Austria rank next. The official invoices of goods shipped to the United States in 1898 amounted to \$1,678,065, which shows a considerable decrease from the official figures of 1895. American manufactures have an excellent reputation for quality, but the cost of transportation prevents American products from successfully competing with those of Great Britain. The chief products of the United States sold in Turkey include agricultural implements and other tools, clocks, watches, cotton goods, and various other commodities. Flour has recently been introduced with some success. An examination of the total tonnage shipped from Turkish ports either directly or indirectly to the United States, and an estimate, based on the value of imports, has led the American consul-general to recommend the establishment of a line of steamers sailing direct from the United States to Turkish ports, and accordingly a line from New York was started in the spring of 1899. The number of vessels in the merchant marine of the Ottoman Empire in 1898 was 87 steamers, of 46,498 tons, and 1349 sailing craft, aggregating 252,947 tons. The entrances and clearances at the port of Constantinople in the year 1897 were 14,753 vessels, registering 11,456,178 tons. The total length of railroads in

operation in 1897 in European and Asiatic Turkey was 2542, the railroad companies being subsidized by the government to the amount of 650,000 Turkish pounds. The empire has 21,800 miles of telegraph lines, with 33,760 miles of wire.

Events of the Year 1899.—In the year 1899 the province of Yemen in Arabia was the seat of an insurrection, for an account of which see the article ARABIA. It was estimated on good authority that 80,000 Armenians—men, women, and children—were in destitute circumstances, and dependent upon the charitable efforts of various societies in Europe and America. The Sultan promised to pay \$100,000 to American claimants on account of damages received in the Armenian troubles of 1895. An iradé of the Sultan in 1899 made provision for certain reforms in the administration of Armenia. The reforms included the following features: (1) The free movement of the Armenians in the provinces was to be allowed, except persons who were under suspicion; (2) monasteries, churches, and schools destroyed during the Armenian disorders were to be rebuilt or repaired with the help of the government; (3) sums of money owed by the Turkish government to Armenian officials who were killed in the massacres were to be paid; (4) an orphanage was to be built at Yedikule, a short distance from Constantinople; (5) fifty-four Armenians were to be pardoned and twenty-four others, formerly sentenced to death, were to be imprisoned for life. A number of massacres occurred in November, 1899, in Alashgerd, in the northeastern district of Armenia, the conflicting parties being Armenians and Kurds. The political party known as "young Turkey" in 1899 assumed proportions which caused alarm to the Porte, and Mahmud Pasha, a brother of the Sultan, was forced to leave the country, being suspected of complication in the designs of this revolutionary movement. In 1899 the government instituted a permanent agricultural exhibition in Constantinople for the purpose of disseminating knowledge, awaking interest, and fostering enterprise in agriculture. A feature of the exhibition will be the instruction given to Turkish agriculturists by American specialists, concerning the use of modern agricultural machinery. For an account of the tributary states and those nominally subject to Turkey, see BULGARIA; BOSNIA AND HERZEGOVINA; ROUMANIA; CRETE; and EGYPT.

TURNER, JOHN WESLEY, major-general, United States Army, resigned, died in St. Louis, Mo., April 8, 1899. He was born in Saratoga County, New York, July 19, 1833; was graduated from the Military Academy at West Point in 1855, and was assigned to the First Artillery. He took part in the Seminole War, 1857-58; at the beginning of the Civil War was promoted to the rank of first lieutenant, and soon became a captain and commissary of subsistence. Subsequently he was made a colonel and chief-of-staff of the Department of the South, and in this capacity took an active part in the operations against Fort Wagner and Fort Sumter. Having been raised to the rank of brigadier-general of volunteers in September, 1863, he was placed in command of the Tenth Corps, Army of the James; with this command he participated in the engagements before Richmond until August 1864. Afterward he was appointed chief-of-staff in the Department of Virginia and North Carolina. For "services in the field" he was brevetted major-general, United States Army. Being mustered out of the volunteer service in September, 1866, he acted as depot commissioner at St. Louis until September, 1871, when he resigned from the army and entered upon the profession of civil engineer. In 1877 General Turner was chosen a member of the Board of Public Works of St. Louis and street commissioner, in which position he was serving at the time of his death.

TUSKEGEE NORMAL AND INDUSTRIAL INSTITUTE, at Tuskegee, Ala., was founded in 1881 for the mental, religious, and industrial training of young colored men and women. Instruction is given in agriculture, blacksmithing, brick masonry, carpentry, and many other trades. The institute had in 1899 an average attendance of 1218 students coming from 23 States and Territories, and from Cuba, Puerto Rico, Africa, and England. There were 88 officers and teachers, an endowment fund of \$154,000, and a library of 5000 volumes. The property owned by the institution is valued at \$300,000. A sum of \$24,000 was received from the estate of Mr. Edwin Austin. Mrs. C. P. Huntington gave \$10,000 for the erection of an additional dormitory for girls, the total cash receipts for the fiscal year being \$104,636. Principal, Booker T. Washington.

TYPHOID FEVER. The prevalence of enteric, or typhoid, fever in the Netherlands in 1899 was discussed at length by the members of the Epidemiological Society of London at its April meeting. A fall of 72 per cent. in the typhoid fever mortality among the urban population, and of 60 per cent. in the rural population of the country, is considered due to the sanitation resulting from medical progress (improved supplies of drinking water and methods of sewage disposal), and also to the fact that the people are enjoying a diminished infectivity. This view was shared by Dr. R. H. Saltet, professor of hygiene and preventive medicine in the

University of Amsterdam; Shirley Murphy, of the London County Council and ex-president of the Epidemiological Society; and Dr. Lane Notter, professor of hygiene in the Army Medical School at Netley, shared this view. Opinions regarding the Widal reaction are changing with new experience. Experimenters are inclined to regard reaction to this test as an immunity reaction, and not merely a reaction of infection, as assumed by Widal. The agglutinins are not the true immunizing substances, and their quantity bears no relation to the degree of immunity. Certainly in some cases of the disease the test fails. In general, the cases with a relative slowing of the pulse have exhibited a more marked agglutination. There appears to be no relation between the gravity of the infection and the height of the fever, on the one hand, and the time of appearance and intensity of agglutination on the other. The cases that present a strong agglutination are shorter in duration than those in which the reaction is weak. In short, the stronger the reaction the more favorable the prognosis. The reaction is feeblor in children under 7 years than in adults, and it disappears earlier; nevertheless, it is perhaps the most valuable sign, in children, of typhoid fever. These conclusions are reached by Kasel and Mann.

In cases of typhoid in which perforation occurs, W. W. Keen, of Philadelphia, summarizes his views on operative treatment as follows: (1) The surgeon should be called in consultation the moment that any abdominal symptoms indicative of possible perforation are observed. (2) If it be possible to determine the existence of the preperforative stage, exploratory operation should be done under cocaine-anesthesia before perforation, shock, and sepsis have occurred. (3) After perforation has occurred, operation should be done at the earliest possible moment, provided, (4) that we wait till the primary shock, if any be present, has subsided. (5) In a case of suspected but doubtful perforation, a small exploratory opening should be made under cocaine to determine the existence of a perforation, and if hospital facilities for a blood-count and for immediate bacteriological observation exist, their aid should be invoked. (6) The operation should be done quickly, but thoroughly, and in accordance with the technic already indicated. (7) The profession at large must be aroused to the possibility of a cure in nearly, if not quite, one-third of the cases of perforation, provided speedy surgical aid is invoked.

The treatment of typhoid fever with an antityphoid extract promises fair results. Jez, in the *Wiener Medicinische Wochenschrift* for February 18, 1899, published the result of his observations and experiments in this line. He found that he was able to obtain from the organs of animals inoculated with typhoid bacilli substances capable of exercising productive and curative influences upon typhoid infection. An antityphoid extract he produced was employed in the treatment of 18 cases of typhoid fever, administered by the mouth, subcutaneous exhibition of it proving less serviceable. In these cases the characteristic fever curve was broken, and the pyrexia soon disappeared; the pulse declined in frequency and increased in strength; diarrhoea ceased; the tongue cleared, and convalescence followed speedily. No unpleasant secondary effects were noticed, even with large doses of the extract.

The India correspondent of the London *Lancet* reported in February, 1899, that inoculation against typhoid seems very successful. A. E. Wright, professor of pathology at Netley Military Hospital, and one of the plague commissioners, inoculated about 3000 British troops in India. He stated to the soldiers that 1500 troops are attacked with typhoid in India every year and that 300 of these died; that of the 200 nurses and attendants exposed during the Maidstone epidemic 95 were inoculated, not one of whom took the fever, while of the remainder 19 died of typhoid; also that of 8 subalterns who went to Khartoum 6 were inoculated and remained well, both of the others being attacked with fever which proved fatal in the case of one. The symptoms following inoculation are malaise and slight fever lasting generally not over 24 hours. The British War Office has decided that troops proceeding to military stations abroad where enteric fever is rife shall have the opportunity of inoculation against the disease. Seventy per cent. of the men ordered to Natal have accepted the offer and been inoculated with antityphoid serum. As between 20,000 and 30,000 soldiers were engaged in the African campaign when 1899 closed, the test as to the efficacy of the antityphoid serum will be excellent and valuable. See SERUM THERAPY; THERMOL; VITAL STATISTICS; WATER-SUPPLY.

TYPOGRAPHICAL UNION, INTERNATIONAL, organized in 1855, had in 1899 a membership of 38,000; publishes the *Typographical Journal*. The general meeting for 1900 to be in Milwaukee, Wis., August 13-18. President, Samuel B. Donnelly; secretary, John W. Bramwood, 7 DeSoto Block, Indianapolis, Ind.

UGANDA is a British protectorate in the interior of East Africa, and includes, besides Uganda proper, the territories known as Unyoro and Usoga, and several other divisions. The whole protectorate lies west of the East Africa Protectorate and adjacent to Lake Victoria Nyanza, and contains the head-waters of the Nile River. The total population has been roughly estimated at from two to three

millions; the population of Uganda proper is from 300,000 to 500,000. The capital of the latter is Mengo, but the administrative centre of the protectorate is Kampala, where there is a British fort. The government is administered by a British commissioner, but the native prince retains a nominal authority in Uganda proper. Uganda lies mostly on a plateau, and possesses a good soil and climate, besides being well watered. It is adapted to the successful growth of both temperate and tropical crops and is, altogether, capable of a great development, which is expected to be much furthered by the completion of the railroad from Mombasa on the coast to Lake Victoria Nyanza. At the close of 1899 less than 200 miles remained uncompleted of the total 560 miles of this road. Much discussion has occurred concerning the Uganda railroad since the parliamentary grant of £3,000,000 in 1896 for its construction. An English writer ridiculed it recently as a road "from nowhere to nowhere," claiming that it has no reason for existence and that the portion already said to be in operation is "open for traffic as a beggar's hat is open to receive checks of £1000." On the other hand, Colonel F. D. Lugard, who led the British invasion in Uganda in 1891, and who knows the country, describes this railway as running "from one of the finest harbors in the world to the second largest lake on the planet," through a rich, well-watered region, with a promising commercial future. This railroad passes within 40 miles of Mount Kilima-Njaro, the highest mountain of Africa. In the fall of 1898, after the pacification of the revolting Uganda troops, Major Cyril Martyr undertook the reorganization of the Soudanese soldiery and set out on an expedition through the British sphere of influence in the equatorial provinces. His purpose was to occupy certain posts, to make treaties, and establish relations with the native tribes, and build a series of forts to connect with the outposts of the Anglo-Egyptian Soudan. The result of his expedition was the establishment of an effective occupation as far north as Rejaf, an advance of 180 miles beyond the former outposts at Foweira and Fajao, on the Nile, which lies about 140 miles north of the capital of Uganda. Several outposts, some sixty miles north, were established along the River Nile, and one was built to command the overland route to the Nile. These posts were strongly garrisoned with Soudanese troops. One break remains in the line of posts now established from Mombasa to Cairo in Egypt, some 350 miles of waterway between Rejaf and Fashoda having yet to be brought under British control. It is believed that this may easily be traversed and controlled, but a stretch of about 150 miles of the river is obstructed by an impassable tropical growth of a lacustrine nature, which complicates the problem of control. An important expedition, which returned in 1899, was that of Colonel Macdonald, in East Africa. This party explored and mapped a large territory, extending as far as beyond Lake Rudolph, toward Abyssinia, and friendly relations were entered into with the various tribes. Some trouble was encountered, however, and one of the officers, Captain Kirkpatrick, was killed by a native, near the Karamoyo country. Dr. Donaldson Smith, a pioneer explorer in East Africa, returned for further exploration during the year. Among other scientific expeditions was the first ascent made of Mount Kenya, which was climbed in September, 1899, by Dr. Mackinder and two Alpine guides. The height was found to be between 17,000 and 18,000 feet. Fifteen glaciers were noted upon the flanks of this mountain. A new special commissioner to Uganda was appointed in 1899 in the person of Sir H. H. Johnson, K.C.B.

UNDERGROUND RAILWAYS. See RAPID TRANSIT (paragraph Underground Railways).

UNION VETERAN LEGION, organized in 1884, had in 1899 over 20,000 members, veterans of the war of 1861-65, who volunteered prior to July 1, 1863. There are 152 encampments in 21 States and the District of Columbia. National commander, W. R. Wooters; adjutant-general, John N. Rober, Philadelphia, Penn.

UNION VETERANS' UNION, founded in 1886, is composed of honorably discharged Union soldiers, sailors, and marines who served six months or more in the war of 1861-65. Commander-in-chief, Charles W. Wood, Worcester, Mass.; adjutant-general, C. W. Putnam, Worcester, Mass.

UNITARIANS. This sect reports for 1899 a prosperous year, and numbers 552 ministers, 460 churches, and 75,000 communicants. The American Unitarian Association, organized in Boston in 1825, has for its objects the collection and diffusion of information regarding the state of unitarianism in the United States, the supplying of missionaries, and various benevolent aims. It holds annual meetings at Boston in May. Secretary, Rev. Samuel A. Eliot, Cambridge, Mass.

UNITED BRETHREN IN CHRIST, founded in 1760 by Philip William Otterbein, reports for 1899 an uneventful year. Two missionaries were sent to Ponce, Puerto Rico, and six new missionaries were sent to Africa. This body reports, for the past year, 2529 ministers, 4965 churches, and 264,980 members, a decrease of 20,900 for 1899. This decrease is explained by the wrecking of the missionary work in Africa in 1898, due to the massacre of missionaries engaged there.

UNITED CONFEDERATE VETERANS, organized in 1889, had in 1899, 1170 camps and about 45,000 members. Its aims are literary, historical, social, and benevolent. The headquarters are in New Orleans, La.; commander, General John B. Gordon, of Georgia; adjutant-general and chief of staff, Major-General George Moorman, New Orleans, La. The organ of this association is the *Confederate Veteran*.

UNITED EVANGELICAL CHURCH had in 1899, 454 ministers, 734 churches, with membership of 59,830; 810 Sunday-schools, with 10,764 teachers and 75,481 scholars, and church property valued at \$2,154,169. A new annual conference was organized in the far West. Fourteen periodicals are published, three being in German. The total numbers of the Evangelical bodies are 1485 ministers, 2553 churches, and 177,443 church members. See **EVANGELICAL ASSOCIATION**.

UNITED PRESBYTERIAN CHURCH OF NORTH AMERICA reports a successful year, having 966 ministers, 968 congregations, 32 churches erected, and 126,783 communicants, 12,148 of whom are in the foreign field. The Synod of the Nile has four presbyteries.

UNITED SONS OF CONFEDERATE VETERANS, organized at Charleston, S. C., in 1896, held a reunion there in 1899. Commander-in-chief, Walter T. Colquitt; adjutant-general, L. D. T. Quinby, Atlanta, Ga.

UNITED STATES. The total area of the United States is 3,025,600 square miles, with an estimated population on December 31, 1899, of 76,977,000, including Alaska. The area of the latter territory is estimated at 577,600 square miles. The recently acquired islands of Hawaii, Guam, the Philippines, Puerto Rico, and Tutuila in Samoa, and the island of Cuba, under temporary control, have an aggregate area of about 170,000, and an estimated population of from 10,000,000 to 12,000,000.

Agriculture, Live Stock, etc.—The United States is the leading agricultural country in the world, and the year 1899 was one of the most prosperous in its history. The total value of the staple products, corn, wheat, oats, rye, and buckwheat, together with cotton, was nearly \$1,500,000,000, besides one-third as much for hay, potatoes, tobacco, rice, sugar-cane, and beet-root. This country is the world's greatest wheat producer, raising nearly one-fourth of the whole. The centre of cereal production is rapidly moving westward. Minnesota, Kansas, North and South Dakota, and Nebraska are now the five great wheat States, growing 40 per cent. of the American production. The six great corn States are Illinois, Iowa, Kansas, Nebraska, Missouri, and Indiana, which produce over half the corn grown in the United States. This country raises the larger part of the cotton used by the cotton-mills of the world, though Egyptian cotton and some of the products from a few other regions is of superior quality, and is imported even into this country. In 1898 the price of American cotton was low, but in 1899 the world's supply fell off about 1,200,000 bales, resulting in an advance of nearly 50 per cent. in the price of American cotton. The production in America increased. The important products hay and tobacco also showed an increased yield in 1899. Besides its agricultural importance this country furnishes a large amount of meats for the consumption of the world. The total value of farm animals in 1899 was estimated at nearly \$2,000,000,000. The statistics of live stock are necessarily approximate. For 1899 the estimated number of swine was in round numbers 50,000,000; sheep, 42,000,000; milch cows, 16,000,000; and oxen and other cattle, 28,000,000. The number of swine raised is far in excess of that of any other country, and the value has increased one fourth within five years. The value of all other live stock has grown also, especially that of sheep. One item of interest in noting the increased agricultural production of recent years is that it has come about through improved methods and increased acreage largely, and that the agricultural population itself has not greatly increased. A definite result of the prosperity has been the liquidation of many farm mortgages. For details, see the separate articles on **AGRICULTURE**; **CORN**; **WHEAT**; **COTTON**; etc.

Public Domain.—Of the public lands, including those in Alaska, there were at the close of the fiscal year ending June 30, 1899, about 929,308,000 acres unappropriated and unreserved, two-thirds of which were unsurveyed, and 727,401,600 acres which had been appropriated or reserved. The unreserved lands in Alaska are mostly unsurveyed and unappropriated. For a discussion of this subject the reader is referred to the article **LANDS, PUBLIC**, in which are treated also the national forest reserves. See also **FORESTRY**.

Commerce.—The foreign commerce of the United States in 1899 showed a continuation of the marked increase which has been a feature of its trade in recent years. While the most wonderful year in her history, the indications were at the close of 1899 that the following year would show a still greater foreign trade. In 1899 this trade was over \$2,000,000,000, with a favorable balance of nearly \$477,000,000. The increased import trade in 1899 was in round numbers about \$164,000,000, and the increase in exports about \$20,000,000, or a total increase in trade of nearly \$184,000,-

000. Our trade showed a growth in all parts of the world, also, especially in Australia and the Far East. Our Asiatic trade increased in round number from \$94,300,000 to \$136,864,000, imports, and from \$47,000,000 to \$54,000,000 exports. We added nearly \$7,000,000 to our imports from China, and \$3,000,000 to our exports there. Our imports from Japan increased \$11,000,000, and our exports by \$1,000,000. Our imports from Oceania increased nearly \$6,000,000, although the British Australasian trade fell off over \$2,000,000, due mostly to the droughts in Australia, from which country we take much wool. Our exports to Oceania increased nearly \$13,000,000, half of which increase was with British Australasia. Our African imports increased about \$3,500,000, our export trade remaining about stationary. South American trade showed a healthy, but not remarkable, growth. Our trade with the West Indies increased nearly \$14,000,000 for imports, and still more for our exports there. From Europe we purchased over \$77,000,000 worth of goods more than in the previous year, but our exports fell off to the amount of nearly \$22,000,000. Our imports from the United Kingdom increased \$31,000,000, our exports decreased nearly \$29,000,000; our French imports increased over \$14,000,000, while our exports fell off nearly \$10,000,000, and there was a similar increase of imports and decrease of exports in our trade with Germany.

In our export trade the most striking fact is the great increase of manufactures, which in 1899 were over 30 per cent. of the total exports, or \$380,787,891. Agricultural products exported were somewhat less than in 1898, but they still formed nearly two-thirds of our exports, being valued in 1899 at \$782,105,048, or over 62 per cent. Forest woods and products were \$47,562,121, or 4 per cent., and mining products \$33,279,187, or 3 per cent. The most important single class of exports was breadstuffs, \$269,955,771. Then follow cotton, mostly raw, \$216,020,033; iron and steel, and manufactures of, \$105,689,645, great increases; crude and refined mineral oils, \$65,384,128; wood and manufactures of, copper and copper manufactures, tobacco and manufactures of tobacco, leather and leather goods, including gloves; oil cake, etc.; vegetable oils, etc. Our most important article of import was sugar, \$108,124,877, the principal sources being the East Indies, Hawaii, Cuba, and Germany. Then came raw silk, \$43,546,872, mostly from Japan, China, and Italy, and \$27,880,683 silk manufactures, nearly 50 per cent. French. Other leading imports were hides and skins, \$51,127,659; coffee, \$56,068,980, Brazil by far the largest producer; wool and hair, largely Australian; chemicals, drugs, and dyes; india rubber, etc., mostly Brazilian; raw cotton, largely Egyptian, and cotton manufactures, mostly European; vegetable fibres, including flax, mostly European; jute, East Indian; manila, from the Philippines, and sisal grass, from Mexico; jewelry, precious stones, etc., also fruits and nuts, copper ores and ingots, iron and wood manufactures, wines, tobacco, tea, plate and pig-tin, raw and manufactured leather, gloves, earthen and china-ware, feathers, furs, fish, cocoa, oils, spirits, metal manufactures, etc.

The commerce with Puerto Rico, Cuba, Hawaii, and the Philippines has shown a marked growth both in imports and exports since those islands have come into closer touch with the United States. The secretary of the treasury in his report for 1899 calls attention to the fact that Cuba and the new possessions of this country offer a natural market in both branches of trade. "The classes of agricultural productions," he says, "for which the United States relies, and in most of them must continue to rely, upon tropical countries, form a large proportion of our natural and necessary imports. Our importations of coffee, sugar, tropical fruits, tobacco of high grade, hemp, jute, etc., with sundry other miscellaneous products of tropical climates, average \$250,000,000 annually, and all of these are produced in greater or less degree in the islands in question, while they in turn must rely upon the temperate zones for their supplies of wheat and flour, provisions, clothing, and manufactures of various classes. As a result, the commerce between the United States and these islands is already showing a marked growth, and there is every reason to believe that it will continue to increase." The statistics given in the preceding paragraphs on the general commerce of the United States are for the calendar year 1899. In the following table the growth of trade with the various islands is shown, but the figures there given by the Treasury reports are for the fiscal year ending June 30 instead of for the calendar year. The table shows quite well, however, the marked increased of trade in the years mentioned.

YEAR.	PUERTO RICO.		CUBA.		HAWAIIAN ISLANDS.		PHILIPPINE ISLANDS.	
	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.
1897.....	\$2,181,024	\$1,989,888	\$13,406,815	\$8,359,776	\$18,647,799	\$4,690,075	\$4,383,740	\$94,597
1898....	2,414,886	1,505,946	15,232,477	9,561,656	17,187,880	5,907,155	3,880,415	127,804
1899....	3,179,827	2,685,848	25,408,828	18,616,377	17,831,463	9,305,470	4,409,774	404,133

For the calendar year 1899 the relative value of the foreign trade of the United States is shown in the succeeding statement of Treasurer Gage:

COUNTRIES.	Imports From.	Exports To.	COUNTRIES.	Imports From.	Exports To.
EUROPE.			SOUTH AMERICA.		
Austria-Hungary.....	<i>Dollars.</i> 8,054,489	<i>Dollars.</i> 6,358,788	Argentina.....	5,997,373	11,325,357
Azores, and Madeira Islands.....	11,283	374,625	Bolivia.....		27,448
Belgium.....	11,733,802	45,818,633	Brazil.....	59,580,868	11,453,997
Denmark.....	659,308	18,474,444	Chile.....	5,232,702	2,240,104
France.....	70,404,908	70,107,127	Colombia.....	5,462,432	2,985,501
Germany.....	89,579,359	161,408,852	Ecuador.....	1,098,081	1,179,519
Gibraltar.....	27,307	420,053	Falkland Islands.....		
Greece.....	1,002,403	226,508	Guianas:		
Greenland, Iceland, etc.....	78,558	6,164	British.....	3,518,768	1,709,199
Italy.....	26,459,351	25,783,089	Dutch.....	1,546,226	481,904
Malta, Gozo, etc.....	9,548	204,661	French.....	13,147	208,707
Netherlands.....	15,278,069	83,601,438	Paraguay.....		11,159
Portugal.....	3,774,642	5,113,534	Peru.....	2,098,575	1,395,046
Roumania.....		145,104	Uruguay.....	1,512,605	1,702,009
Russia, Baltic, etc.....	3,872,146	6,166,964	Venezuela.....	5,609,225	2,641,390
Russia, Black Sea.....	1,917,840	1,148,874			
Servia.....		217	Total South America.....	91,728,862	37,421,709
Spain.....	5,841,636	11,526,777			
Sweden and Norway.....	3,087,113	11,816,708	ASIA.		
Switzerland.....	16,288,947	215,895	Aden.....	1,652,948	1,417,685
Turkey in Europe.....	3,113,881	381,746	China.....	24,196,476	15,225,294
United Kingdom.....	142,321,497	509,958,335	China—British.....	4,760	
Total Europe.....	402,507,267	939,324,520	German.....		29,202
			Russian.....		194,183
NORTH AMERICA.			East Indies:		
Bermuda.....	525,425	1,175,570	British.....	38,386,097	4,510,346
British Honduras.....	209,414	561,873	Dutch.....	32,308,633	1,652,904
			French.....	4	100,563
British North America:			Portuguese.....	9	
Nova Scotia, New Brunswick, etc.....	4,773,638	5,764,850	Hong Kong.....	2,399,943	7,787,719
Quebec, Ontario, etc.....	25,822,792	75,615,500	Japan.....	34,208,587	20,604,774
British Columbia.....	4,748,155	4,955,960	Korea.....	408	128,099
Newfoundland and Labrador.....	535,185	1,948,468	Russia, Asiatic.....	57	1,356,355
Total British North America.....	35,879,770	88,284,778	Turkey in Asia.....	3,590,126	181,211
			All other Asia.....	180,871	155,519
Central American States:			Total Asia.....	136,863,919	53,843,554
Costa Rica.....	3,549,468	1,282,797			
Guatemala.....	2,197,641	843,565	OCEANIA.		
Honduras.....	880,287	1,083,904	Auckland, Fiji, etc.....	1,630,378	12,549
Nicaragua.....	1,594,719	1,496,352	British Australasia.....	3,597,228	24,143,591
Salvador.....	1,082,964	634,591	French Oceania.....	343,668	330,347
Total Central American States.....	9,305,079	5,286,209	German Oceania.....		15,190
			Guam.....	10,649	
Mexico.....	24,625,000	29,308,802	Tonga, Samoa, etc.....	47,432	73,465
Miquelon, Langley, etc.....	64,897	165,280	Hawaiian Islands.....	22,183,306	11,305,581
			Philippine Islands.....	4,903,467	1,663,213
West Indies:			Total Oceania.....	32,656,063	37,642,936
British.....	14,340,364	9,305,954			
Cuba.....	29,619,759	24,861,981	AFRICA.		
Danish.....	707,731	578,147	British Africa.....	1,375,786	15,424,000
Dutch.....	394,798	537,509	Canary Islands.....	14,714	271,021
French.....	29,877	1,714,125	French Africa.....	570,811	448,404
Haiti.....	862,051	2,387,569	German Africa.....		708
Puerto Rico.....	3,416,081	3,677,564	Liberia.....	5,570	16,545
Santo Domingo.....	3,367,058	1,118,933	Madagascar.....	3,576	12,544
Total West Indies.....	52,739,219	44,071,055	Portuguese Africa.....	13,468	1,214,240
			Spanish Africa.....		
Total North America.....	123,848,804	168,854,567	Turkey in Africa:		
			Egypt.....	8,584,250	525,039
			Tripoli.....	101,388	278
			All other Africa.....	1,071,215	689,622
			Total Africa.....	11,740,636	18,602,394
			Grand total.....	798,845,571	1,275,493,671

Industries.—The year 1899 was marked by a general industrial prosperity, a rise of wages and of the price of goods, and by an unprecedented increase in the export of manufactures. See MANUFACTURES; IRON AND STEEL; MINING; COTTON AND THE COTTON INDUSTRIES; SUGAR; RAILWAYS; STRIKES AND LOCKOUTS; SILK MANUFACTURES.

Internal Communications.—The two principal authorities on railroad matters are the annual reports of the Inter-State Commerce Commission, and *Poor's Manual*. Neither brings the statistics of railroads down to the year 1899. The latter work shows that on December 31, 1898, the total mileage of surface steam railroads in the United States was 186,809.63, an increase during the previous twelve months of

1915.3 miles. The capital stock of all railroads was \$5,581,522,858; bonded stock \$5,635,363,594; unfunded debt, \$368,182,584; current accounts, \$383,682,168; profit and loss, \$457,898,053, making the total liabilities for the year \$12,426,649,257. The assets included the following items: Cost of railroads and equipment, \$10,256,275,585; investments, \$1,594,565,979; other assets, \$265,264,972; current accounts, \$169,261,166; profit and loss, \$141,281,555. The traffic earnings of the year were, from passengers, \$272,589,591; freight, \$868,924,526; miscellaneous, \$99,180,966; total gross earnings, \$1,249,558,724. The net earnings were \$389,666,474, which with a revenue of \$104,536,904 from other sources made a total available revenue of \$494,203,378. The surplus for the year was \$58,642,238, a large gain over the preceding year. During the year the casualties to railroad employees was 1958 killed, 31,761 injured. Among passengers 221 were killed and 2945 injured. Only one passenger to every 2,267,270 carried was killed, and one passenger injured to 170,141 carried.

Immigration.—The principal features of immigration into the United States during the fiscal year ending June 30, 1899, is sketched in the article IMMIGRATION (*q. v.*). The number of immigrants and the countries from which they came are given for that period in the following table, as well as for the preceding fiscal year:

COUNTRIES.	1897-98.	1898-99.	Increase.	Decrease.
Austria-Hungary	89,797	68,491	22,094	
Belgium	696	1,101	406	
Denmark	1,946	2,680	744	
France, including Corsica	1,990	1,694		296
German Empire	17,111	17,476	365	
Greece	2,389	2,333		6
Italy, including Sicily and Sardinia	58,613	77,419	18,806	
Netherlands	767	1,029	262	
Norway	4,938	6,705	1,767	
Portugal, including Cape de Verde and Azore Islands	1,717	2,054	337	
Poland	4,736			4,736
Roumania	900	1,606	706	
Russian Empire and Finland	29,888	60,983	31,154	
Serbia, Bulgaria, and Montenegro		52	52	
Spain, including Canary and Balearic Islands	577	385		192
Sweden	12,398	12,797	399	
Switzerland	1,246	1,326	80	
Turkey in Europe	176	80		96
United Kingdom	38,021	45,123	7,102	
Not specified	1	6	5	
Total, Europe	217,786	297,349	84,679	5,316
China	2,071	1,060		411
Japan	2,220	2,844	614	
India		17	17	
Turkey in Asia	4,875	4,436	161	
Other Asia	61	15		46
Total, Asia	8,637	8,973	792	457
Africa	48	51	3	
Australia, Tasmania, and New Zealand	153	456	303	
Hawaiian Islands	40	256	216	
Philippine Islands		19	19	
Pacific Islands not specified	8	79	71	
British North America	330	1,322	972	
British Honduras	2			2
Other Central America	5	159	154	
Mexico	107	161	54	
South America	39	89	50	
West Indies	2,184	2,585	461	
All other countries		217	217	
Grand total	229,299	311,715	83,191	5,773
Net Increase			82,416	

Navigation.—The United States commissioner of navigation, in his report to the Treasury Department for the fiscal year ending June 30, 1899, made a number of interesting statements regarding the growth of the merchant marine. The total documented tonnage on June 30 was the largest since 1865, and the registered tonnage the largest since 1875; the tonnage enrolled for the coasting trade was the largest in our history and greater than the coasting tonnage of any other nation; we built more vessels in 1899 than in any year since 1875, excepting the year 1891; we built more steel vessels than in any year in our history, and the production on the Pacific coast was double that of any year except 1898. There is a reverse, the

commissioner adds, to these statements. During the fiscal year 1898-99 American vessels carried the smallest percentage of our exports and imports in our history. The commissioner continued the discussion contained in his previous report regarding the promotion, by legislation of some sort, of the American merchant marine. He mentions five methods which have been proposed in recent years for the increase of the American merchant marine in the foreign trade: First, discriminating duties or additional duties on imports in foreign vessels or on the tonnage of foreign vessels entering the United States above those imposed on American vessels or their cargoes; second, bounties on exports in American vessels; third, free registry for foreign-built ships; fourth, mail subsidies to fast steamships; fifth, navigation bounties, based on tonnage, mileage, and speed. The fifth proposition was embodied in a bill before the Fifty-fifth Congress, which proposed to offset by graded payments from the Treasury the difference in the cost of constructing vessels in the United States and in Great Britain and Germany, so far as that difference enters into cost of operation, and also to offset other differences in cost of operation. The maximum expenditure under the bill during any one year is fixed at \$9,000,000, which includes the sum now paid for the carrying of ocean mails on American vessels, which is about \$1,300,000 annually. The maximum figure named in this bill would not be reached in some years, since the number of American steamships of over 14 knots regularly engaged in foreign trade is only 27, aggregating 122,940 gross tons. The amounts which these vessels would receive under the proposed act, conditioned on building new vessels in the United States, and that which they now receive under the present Postal-subsidy law are as follows:

	Proposed Subsidy.	Present Postal Subsidy, 1897.
American Line (4 vessels)	\$1,247,199	\$766,300
New York and Cuba Mail (9 vessels).....	342,399	203,580
Admiral Line (4 vessels).....	98,029	.....
Red "D" Line (7 vessels).....	61,040	82,362
Oceanic Line (3 vessels).....	154,460	135,000
Total	\$1,908,127	\$1,187,242

The figures for 1897 are given, as during part of the years 1898 and 1899 the mail service on American vessels was discontinued on account of the war and the employment of mail steamships as auxiliary cruisers and transports.

The following table gives statistics of the American merchant marine for the fiscal years 1897-98 and 1898-99:

	1898.		1899.	
	Number.	Gross Tons.	Number.	Gross Tons.
GEOGRAPHICAL DISTRIBUTION.				
Atlantic and Gulf coasts.....	16,442	2,553,739	16,275	2,614,869
Pacific coast	1,754	496,767	1,970	539,937
Northern lakes.....	3,256	1,437,500	3,162	1,446,848
Western rivers.....	1,253	261,732	1,321	263,064
Total	22,705	4,749,738	22,728	4,864,288
POWER AND MATERIAL.				
Sail :*				
Wood.....	15,896	2,237,153	15,771	2,214,540
Iron and steel.....	97	140,662	120	173,687
Total	15,993	2,377,815	15,891	2,388,227
Steam :				
Wood	5,775	1,288,785	5,824	1,374,056
Iron and steel.....	937	1,063,138	1,013	1,201,955
Total	6,712	2,351,923	6,837	2,576,011
Canal boats.....	660	74,640	629	71,101
Barges.....	1,667	467,348	1,963	491,806
Total	2,327	541,988	2,591	562,909

* Including canal boats and barges.

	1898.		1899.	
	Number.	Gross Tons.	Number.	Gross Tons.
TRADE.				
Registered:				
Steam, iron and steel.....	106	280,956	135	289,513
Steam, wood.....	204	63,108	233	71,217
Sail, wood, and iron and steel*.....	824	443,645	964	468,216
Total.....	1,134	787,709	1,331	828,946
Enrolled and licensed:				
Steam, iron and steel.....	829	852,182	878	912,142
Steam, wood.....	5,571	1,225,677	5,592	1,202,639
Sail, wood, and iron and steel†.....	15,169	1,934,179	14,927	1,906,011
Total.....	21,569	4,012,029	21,397	4,015,992
CONSTRUCTION DURING THE YEAR.				
<i>Geographical Distribution.</i>				
Atlantic and Gulf coast.....	514	63,090	631	154,586
Pacific coast.....	228	49,789	306	41,534
Northern lakes.....	87	54,084	122	80,266
Western rivers.....	123	18,495	214	22,522
Total.....	952	180,458	1,273	300,088
<i>Power and Material.</i>				
Sail:				
Wood.....	357	27,622	412	72,535
Steel.....	2	6,794	7	25,536
Steam:				
Wood.....	343	57,337	359	48,040
Iron and steel.....	51	48,501	86	103,018
Canal boats.....	20	2,396	18	1,411
Barges:				
Wood.....	169	30,777	307	46,673
Steel.....	10	7,041	4	2,323
Total.....	953	180,458	1,273	300,088

* Including barges.

† Including canal boats and barges.

The Army.—After a reduction of the army early in 1899 from a war footing of 2324 regular officers and 61,444 men, and 5216 volunteer officers and 110,202 men, to a peace footing of about 26,000 regular soldiers, with nearly the whole volunteer force discharged, authority was granted to again increase the force in view of the Philippine insurrection. In consequence the regular army has been increased to a present standing of 2248 officers and 61,999 men, and a new volunteer force has been created of 1524 officers and 33,050 men. The volunteers are stationed mostly in the Philippines. The regular army is distributed as follows:

	Officers.	Enlisted Men.
In Cuba.....	384	10,796
In Puerto Rico.....	87	2,353
On the continent of North America.....	910	17,217
In Hawaii.....	12	453
In the Philippine Islands.....	905	30,578
Total.....	2,248	61,999

The Navy.—In spite of the notable increases made in the navy during the past few years, the United States war fleet does not yet occupy the position that it should among the navies of the world. The rebuilding of the navy began in 1883, and in the sixteen years ending June 30, 1899, the amount expended in new vessels has been only \$98,529,512, and the estimated sum to be expended on unfinished vessels now in hand is \$62,570,610, making the total expenditure only \$161,160,122. That this sum is comparatively small is shown by the amount paid in the year 1899 alone for pensions, which was \$138,355,053. Foreign navies have in the meantime shown great increases, particularly the navy of Japan. The following comparative table from the latest annual naval returns of the British Parliament shows the condition of the principal fleets of war on December 31, 1899. The leading classes of vessels only are given:

	COMPLETED.							UNDER CONSTRUCTION.						
	England.	France.	Russia.	Germany.	Italy.	United States.	Japan.	England.	France.	Russia.	Germany.	Italy.	United States.	Japan.
Battleships.....	58	31	13	18	15	5	3	17	4	13	7	4	11	4
Armored cruisers.....	17	8	10	3	3	3	3	14	12	2	2	4	3	4
Protected cruisers.....	107	86	3	13	15	14	14	9	4	8	4	3	7	2
Unprotected cruisers.....	15	14	3	21	1	6	9	0	0	0	0	0	0	0
Coast-defence ships.....	13	14	15	11	0	19	4	0	0	1	0	0	4	0
Torpedo-boat destroyers.....	75	2	1	1	0	1	8	33	10	35	9	11	19	4
Torpedo boats.....	95	219	174	113	144	13	29	0	47	6	0	10	14	29

The tendency of modern navy building is toward the construction of larger vessels, one large ship being considered more efficient than two vessels one-half the size, while requiring a smaller crew than the combined force of the two small vessels. A United States Navy Report says: "All countries are at present building battleships of about 12,000 tons, England and Japan even of 15,000 tons. If some of the Powers are building smaller battleships, it may be safely assumed that the reason is lack of funds or that the ships in question are intended for limited modes of warfare." No unprotected cruisers were being constructed by this or any other power in 1899, and although this country was building four coast defence vessels, the tendency at large is rather toward the construction of vessels adapted for battle on the open sea. The secretary made the following recommendations for the increase of the navy:

"The number of large, swift, and powerful armored cruisers of great coal endurance in our navy is largely disproportionate to the rest of the naval establishment. The experience of the last year has also shown the need of several smaller vessels, usually classed as gunboats. It is therefore recommended that Congress be requested to authorize the construction of the following vessels:

First. Three armored cruisers, of about 13,000 tons trial displacement, of a maximum draft at deep load not to exceed 26 feet, carrying the heaviest armor and most powerful ordnance for vessels of their class, to be sheathed and coppered and to have the highest practicable speed and great radius of action.

Second. Twelve gunboats, of about 900 tons trial displacement, to be sheathed and coppered.

And, third, as recommended a year ago, three protected cruisers of about 8000 tons trial displacement, carrying the most powerful ordnance for vessels of their class, to be sheathed and coppered, and to have the highest practicable speed and great radius of action.

The increase in the tonnage of the last three named vessels from 6000 tons, as recommended a year ago, to 8000 tons is suggested by the naval board on construction as better adapted to the present needs of the service. The same board are also of the opinion that if any of the foregoing vessels are authorized, the law should provide that in case satisfactory bids can not be obtained for their construction by contract, the Department shall have authority to construct the same in the navy yards."

During 1899 a large number of vessels were dropped from the American navy. Nine vessels were condemned and sold, about \$450,000 in all being received for them. Since the 1897-98 report of the Navy Department there were dropped also many vessels used during the war. Four large auxiliary cruisers and 2 converted yachts were returned to their owners, 4 light-house tenders, 16 revenue cutters, and 2 fish commission vessels were transferred to the various departments controlling them, and various vessels which had been purchased for war purposes were sold.

Indians, Patents, Pensions, and Lands, Public.—See the special articles on these subjects.

Revenue and Expenditure.—The revenue for the fiscal year ending June 30, 1899, was \$610,982,004.35, and the expenditure \$700,093,564.02. The largest sources of income were internal revenue, \$273,437,162; customs, \$206,128,482; and postal service, \$95,021,384. The principal expenditures of an annual nature were for the military establishment, including river and harbor supervision, \$229,841,254; pensions, \$139,394,929; postal service and postal revenue deficiencies, \$103,232,954; and interest on public debt, about \$40,000,000. The receipts for the fiscal year were increased by over \$116,648,050, in spite of the fact that nearly \$64,750,000, representing the sale of the Union Pacific and Kansas Pacific Railroads had been an item in the receipts for the fiscal year 1898. The principal increases in 1899 were an added income of

\$102,536,520 from internal revenue, and \$56,553,419 from customs. There was also a large increase in expenditures—namely, \$161,703,597—the largest items being the expenditure of \$20,000,000 in the fulfilment of treaty obligations with Spain, \$62,951,019 increase for the quartermasters' department of the military establishment, and \$48,145,489 for Cuban and Philippine expeditions. "The transactions of the fiscal year, as shown by the report of the treasurer of the United States, were of unusual magnitude, the net ordinary receipts having been exceeded but once, in 1866, and the net ordinary expenditures in 1863, 1864, and 1865 only. Inclusive of the amounts involved in the issue and redemption of bonds, notes, and certificates, the gross receipts, under warrant, were \$1,038,451,340.18, and the gross expenditures \$946,222,148.83. There was, in consequence, an addition of \$92,229,191.35 to the general Treasury balance, which increased from \$775,751,368.11 to \$867,980,559.46." As will be seen from the figures given at the beginning of this paragraph there was a deficiency in the ordinary revenue of \$89,111,559.67. Nevertheless, the excess of receipts over disbursements on account of loans was sufficient to realize a net surplus of \$100,791,521.35 as the result of the fiscal operations of the year. The secretary of the Treasury reports that the popular subscriptions to the war loan came from every part of the country, and were largely paid into the Treasury in gold.

The revenues of the government for the fiscal year ending June 30, 1900, are estimated upon the basis of existing laws:

From customs.....	\$225,000,000.00
From internal revenue.....	290,000,000.00
From miscellaneous sources.....	25,000,000.00
From Postal Service.....	100,958,112.00
Estimated revenues.....	<u>\$640,958,112.00</u>

The expenditures for the same period are estimated as follows:

For the civil establishment.....	\$100,000,000.00
For the military establishment.....	150,000,000.00
For the naval establishment.....	55,000,000.00
For the Indian Service.....	11,000,000.00
For pensions.....	144,000,000.00
For interest on the public debt.....	40,000,000.00
For Postal Service.....	100,958,112.00
Estimated expenditures.....	<u>\$600,958,112.00</u>

Treasury Operations.—The large financial transactions of the fiscal year have already been touched upon in the preceding paragraph on Receipts and Expenditures. The gold holdings of the Treasury are reported to have exceeded all previous records, both in the aggregate and in the net amount above outstanding gold certificates. On October 31, 1899, the gross amount of gold coin and bullion was \$379,817,316. The maximum net gold was \$258,081,565 on October 12.

Important changes took place during the year in the composition and distribution of notes and silver certificates in circulation. The amount of these was increased by \$43,828,386, reducing the paper holdings of the Treasury to the minimum required for the transaction of business. The outstanding Treasury notes of 1890 were cut down, by cancellation on redemption in silver dollars, from \$101,207,280 to \$93,518,280. This process, however, did not involve a contraction of the currency, since the coins paid out for the notes either remained in circulation or were redeposited in the Treasury for silver certificates.

The National Debt.—The amount and classification of the public debt on December 31, 1899, was as follows:

Interest-bearing debt.....	\$1,026,772,320.00
Debt on which interest has ceased since maturity.....	1,208,500.26
Debt bearing no interest.....	<u>389,914,640.16</u>
Aggregate of interest and noninterest-bearing debt.....	\$1,417,895,460.42
Certificates and Treasury notes offset by an equal amount of cash in the Treasury	<u>686,979,403.00</u>
Aggregate of debt, including certificates and Treasury notes...	<u>\$2,104,874,863.42</u>

At the same time the amount of cash in the Treasury was as follows:

CLASSIFICATION.		
Gold:	<i>Dollars.</i>	<i>Dollars.</i>
Coin	253,555,094.07	
Bars	144,476,933.32	398,032,027.39
Silver:		
Dollars	413,322,656.00	
Subsidiary coin	2,992,890.89	
Bars	80,865,663.12	407,200,739.01
Paper:		
United States notes	28,411,651.00	
Treasury notes of 1890	1,386,929.00	
Gold certificates	28,721,822.00	
Silver certificates	6,428,688.00	
Certificates of deposit, Act June 8, 1872	370,000.00	
National-bank notes	4,275,580.04	64,568,670.04
Other:		
Bonds, interest and coupons paid, awaiting reimbursement....	564,042.80	
Minor coin and fractional currency	317,889.42	
Deposits in National-bank depositories—		
General account	80,914,640.29	
Disbursing officers' balances	6,288,533.02	88,184,605.53
Aggregate		1,048,006,041.97
DEMAND LIABILITIES.		
Gold certificates	<i>Dollars.</i>	<i>Dollars.</i>
Silver certificates	184,844,619.00	
Certificates of deposit, Act June 8, 1872	401,484,504.00	
Treasury notes of 1890	12,350,000.00	
	88,320,280.00	686,979,408.00
Fund for redemption of uncurrent National-bank notes	9,355,497.51	
Outstanding checks and drafts	3,214,684.19	
Disbursing officers' balances	55,815,631.69	
Agency accounts, etc.	9,045,372.31	77,431,185.70
	<i>Dollars.</i>	
Gold reserve	100,000,000.00	
Net cash balance	183,595,453.27	283,595,453.27
Aggregate		1,048,006,041.97

Currency.—For currency discussions the reader is referred to the articles CURRENCY REFORM and BANKS. For the production of gold and silver in the United States, see the articles GOLD and SILVER. The year 1898 was in some respects the most remarkable year in the financial history of the country. Although the original deposits of gold bullion at the mints and assay offices was in 1899 slightly below those for 1898, the figures for 1899 being \$143,497,191, domestic deposits were the largest known, \$76,252,487. In regard to the movement of gold to and from the country, the imports for the fiscal year 1899 were \$84,280,674, and the exports were \$37,507,771. The imports of gold decreased in 1899 and the outflow of gold largely increased for the year. The exports for 1898 were so low, however, that those for 1899 still remained much smaller in amount than for any year since 1890, excepting 1898 only. And while less gold was imported than in 1898, the amount still remained larger, except for that year, than the imports of any year since 1881. The director of the United States Mint reports that the coinage of gold in the fiscal year 1899 was by far the greatest in our history. The total coinage in all metals was as follows:

DENOMINATIONS.	Pieces.	Value.
Gold:		
Double eagles	3,793,043	\$75,860,860.00
Eagles	1,276,892	12,768,920.00
Half eagles	3,897,432	19,487,110.00
Quarter eagles	24,116	60,290.00
Total gold	8,991,473	\$108,177,180.00
Silver:		
Standard dollars	18,254,709	\$18,254,709.00

DENOMINATIONS.	Pieces.	Value.
Subsidiary:		
Half dollars.....	6,432,259	\$3,216,229.50
Quarter dollars.....	15,622,708	3,907,177.25
Dimes.....	22,430,708	2,243,070.85
Total subsidiary.....	45,485,675	\$9,466,477.60
Total silver.....	63,747,386	\$27,721,586.65
Five-cent nickels.....	11,539,728	\$576,986.40
One-cent bronze.....	37,992,354	\$79,923.54
Total minor.....	49,532,082	\$656,910.14
Total coinage.....	122,270,945	\$126,855,676.79

The total circulation of money on June 30, 1899, is shown in the following comparative table. With an estimated population at the time of 76,148,000, the circulation per capita would be \$25.

	General stock coined or issued.	In Treasury.	Amount in circulation.
Gold coin, including bullion in Treasury.....	\$263,492,354	\$263,780,384	\$678,738,058
Standard silver dollars, including bullion in Treasury.....	563,697,082	502,215,656	61,481,426
Subsidiary silver.....	74,866,532	5,800,722	69,065,810
Gold certificates.....	34,297,819	1,641,900	32,655,919
Silver certificates.....	406,088,504	3,948,887	402,139,617
Treasury notes, Act July 14, 1890.....	98,519,280	856,516	97,662,764
United States notes.....	346,681,016	38,822,174	307,858,842
Currency certificates, Act June 8, 1872.....	21,335,000	1,080,000	20,255,000
National-bank notes.....	241,350,871	3,545,422	237,805,449
	\$2,745,350,508	\$841,278,627	\$1,904,071,881

The amount of money in circulation on December 31, 1899, was \$1,980,398,170.

Banks.—The report of the controller of the currency for the year ending October 31, 1899, gives the following general deductions regarding the banking strength of the country. There were, in 1899, 12,804 banks of all kinds, with 13,153,874 depositor's accounts, representing a total deposit of \$7,513,954,361. The number of loans made were \$5,067,252, the total value of loans and discounts being \$5,751,467,610. The number of individual depositors is constantly increasing, and greatly exceeds that of borrowers. The latter are also increasing in numbers, but in a smaller ratio than the depositors. During the decade ending in 1899 there has been a gradually lessening rate of interest charged by the banks on loans, while at the same time the banks are paying a lessening rate of interest on deposits. The average deposit is shown to be gradually increasing in amount, while the average size of the loans has not varied much in the last decade. The following table shows the condition of national banks on December 2, 1899:

Resources:	Dec. 2, 3602 Banks
Loans and Discounts.....	\$2,479,819,494.90
Overdrafts.....	33,681,370.97
U. S. Bonds to secure circulation.....	234,403,460.00
U. S. Bonds to secure U. S. Deposits.....	81,265,940.00
U. S. Bonds on hand.....	17,717,840.00
Premiums on U. S. Bonds.....	17,375,215.21
Stocks, Securities, etc.....	325,490,163.55
Banking House, Furniture, and Fixtures.....	79,446,858.81
Other Real Estate and Mortgages owned.....	29,662,473.64
Due from National Banks.....	198,611,069.85
Due from State Banks and Bankers.....	60,155,021.84
Due from approved Reserve Agents.....	345,556,047.73
Checks and other Cash Items.....	21,432,440.94
Exchanges for Clearing House.....	90,514,921.48
Bills of other National Banks.....	17,522,237.00
Fractional Currency, Nickles, and Cents.....	1,013,122.40

Resources:		Dec. 2, 1899
Specie		314,825,376.60
Legal-tender Notes		101,675,795.00
U. S. Certificates of Deposit.....		13,055,000.00
Five per cent. Redemption Fund.....		10,298,929.57
Due from Treasurer U. S.....		1,821,144.06
Total.....		\$4,475,343,923.55
Liabilities:		
Capital Stock paid in.....		\$606,725,265.00
Surplus Fund		250,367,691.89
Undivided Profits, less Expenses and Taxes.....		113,958,857.25
National-bank Notes outstanding.....		204,925,357.50
State-bank Notes outstanding.....		53,104.50
Due to other National Banks.....		502,595,827.29
Due to State Banks and Bankers.....		293,721,662.94
Dividends unpaid		1,184,368.99
Individual Deposits		2,380,610,361.43
U. S. Deposits.....		73,866,941.90
Deposits of U. S. Disbursing Officers.....		6,158,557.45
Notes and Bills rediscounted.....		5,001,309.88
Bills payable		13,546,905.23
Liabilities other than those above.....		22,627,712.30
Total.....		\$4,475,343,923.55

Business Activity.—The industrial prosperity of 1899 was shown not only by the growth of foreign commerce, but by an increased demand for products at home, a general rise in wages, and the establishment and enlargement of many industries. The number of incorporations exceeded that of any previous year, the number of new concerns established during the first three months of 1899, it is said, being greater than during the whole of 1898. Considering only the important firms established, the capitalization is placed at over \$4,207,000,000. These industries were capitalized at sums ranging from \$150,000,000 down through \$100,000,000 to various amounts, of which many exceeded \$50,000,000. There was also a large increase in the capitalization of existing industrial concerns, amounting for the important industries to nearly \$250,000,000. There were also many combinations formed, besides increases in the capital stock of various railroads. Perhaps the most prosperous business was the iron and steel trade, the prices in which increased 100 per cent. The growth of the textile industries was also remarkable. The business expansion in the South was a marked feature of the year, but every part of the country shared in the conditions of prosperity. These conditions were reflected in the stock market. An extraordinary amount of business was done in Wall Street during the first three months, being nearly 15,000,000 shares greater than during the same period in 1898. In May, just after the passage of the Ford Franchise bill, taxing corporations in New York State, had somewhat unsettled the market, the sudden death of ex-Governor Flower occurred. Mr. Flower was the most prominent operator on the street at the time, and the news of his death caused almost a panic, and the transfer within two hours on Saturday, May 13, of 745,000 shares in the various stocks represented by him. Nevertheless, the evident prosperity and general confidence were proved by a sharp rally in the market on the following Monday. Toward the end of the year there was considerable depression in stocks. This has been attributed largely to surface conditions and as in no way reflecting industrial tendencies at large, one writer having called it a "prosperity panic." Other conditions were a tight money market, caused largely by the development of business activity itself. The Boer war was another cause. To relieve the temporary stringency in the money market the secretary of the Treasury announced on December 18 that deposits of public money to the amount of \$30,000,000 to \$40,000,000 would be made with banks offering bonds as security. The National City Bank of New York and other banks offered bonds to the amount of \$18,000,000 within the next ten days. The deposit of public funds with private banks aroused sharp criticism in the press, and opinion was divided as to the propriety of such a course.

Bankruptcy.—The bankruptcy law passed in 1898 provides that any person except a wage-earner or a person engaged chiefly in farming may be judged an involuntary bankrupt upon default or an impartial trial. The law sets forth the rights and duties of bankrupts at great length, establishes courts of bankruptcy, defines their jurisdiction and procedure, and creates the offices of trustee and referee. It was the outcome of a movement extending over many years to secure a uniform system of

bankruptcy. The operation of the law aroused some criticism, and the modification of it in some particulars was discussed. The number of failures in the year ending December 1, 1899, was 9700 as against 12,569 in the previous year, and the liabilities \$89,292,750, as against \$130,636,796. With the exception of 1880 and 1881 the number of failures in 1899 was smaller than in any one of the previous twenty-five years, the average liability smaller than in any previous year, and the ratio of default to solvency was also smaller (97 cents per \$1000).

HISTORY.

Congress.—The third session of the Fifty-fifth Congress opened on December 5, 1898. Among other recommendations made by the President in his message were the following: That the Cuban people should be aided in the formation of a government, and that the military régime should continue until a stable civil government was established; that Congress should provide for the construction of an inter-oceanic ship-canal to be controlled by the United States; that the regular army should be increased to 100,000 men; that the addition of fifteen vessels should be made to the navy; that a measure of currency reform along lines already suggested should be carried out. The most important occurrence in the early part of the session was the transmission to the Senate of the treaty of peace with Spain on January 4, 1899. There was a strong opposition to the ratification of the treaty, and for a time it seemed doubtful if the necessary two-thirds vote could be secured. An amendment was offered declaring that Spain merely relinquished her sovereignty, and that the United States government was assuming only temporary control, but on February 6 this was defeated. The treaty was now ratified by a vote of 57 to 27. The House bill for the increase and reorganization of the army was passed on January 31, but it encountered opposition in the Senate, and a compromise measure was offered in its stead. This became a law on March 2. It placed the strength of the regular army at 65,000 men until July 1, 1901, and authorized the recruiting of 35,000 volunteers during that period. It also authorized the re-enlistment of volunteers for six months. The Naval Appropriation bill and the Navy Personnel bill, which were passed on March 3, fixed the number of sailors in the navy at 17,500 and the number of marines at 6000. Among the other measures passed during the session were an act creating the office of admiral (Rear-Admiral Dewey being immediately raised to that rank); an act providing for the taking of the Twelfth Census of 1900 (see CENSUS); and an act establishing a code of criminal law and procedure for Alaska. Among the bills which failed to pass were the Shipping Subsidy bill, the bills for the establishment of government in Hawaii (see HAWAII); and a bill for the construction of the Nicaragua Canal. (See NICARAGUA CANAL.) In regard to the Nicaragua project, however, its advocates succeeded in obtaining from Congress a grant of \$1,000,000 for the expenses of another investigation of routes. As to currency reform, all that was accomplished was the appointment of a committee in the House to report a measure to the next Congress and the authorization of the Senate finance committee to hold sessions during the recess. The first session of the Fifty-sixth Congress opened on December 4, 1899. David B. Henderson, of Iowa, was unanimously nominated speaker by the Republican caucus. The first question that arose in the session was that of the admission of Mr. Brigham H. Roberts, the Democratic Congressman-elect from Utah. (An account of the discussion on this matter will be found in the article MORMONISM.) The composition of both houses of Congress was as follows: Senate, 52 Republicans, 26 Democrats, 4 Populists, 2 Silverites, and 2 Independents; the House, 185 Republicans, 164 Democrats, 5 Populists, and 3 Silverites. One of the chief matters to come before Congress was the currency question, and bills for the reform of the currency and the establishment of the gold standard were drafted, both in the House and in the Senate. See CURRENCY REFORM.

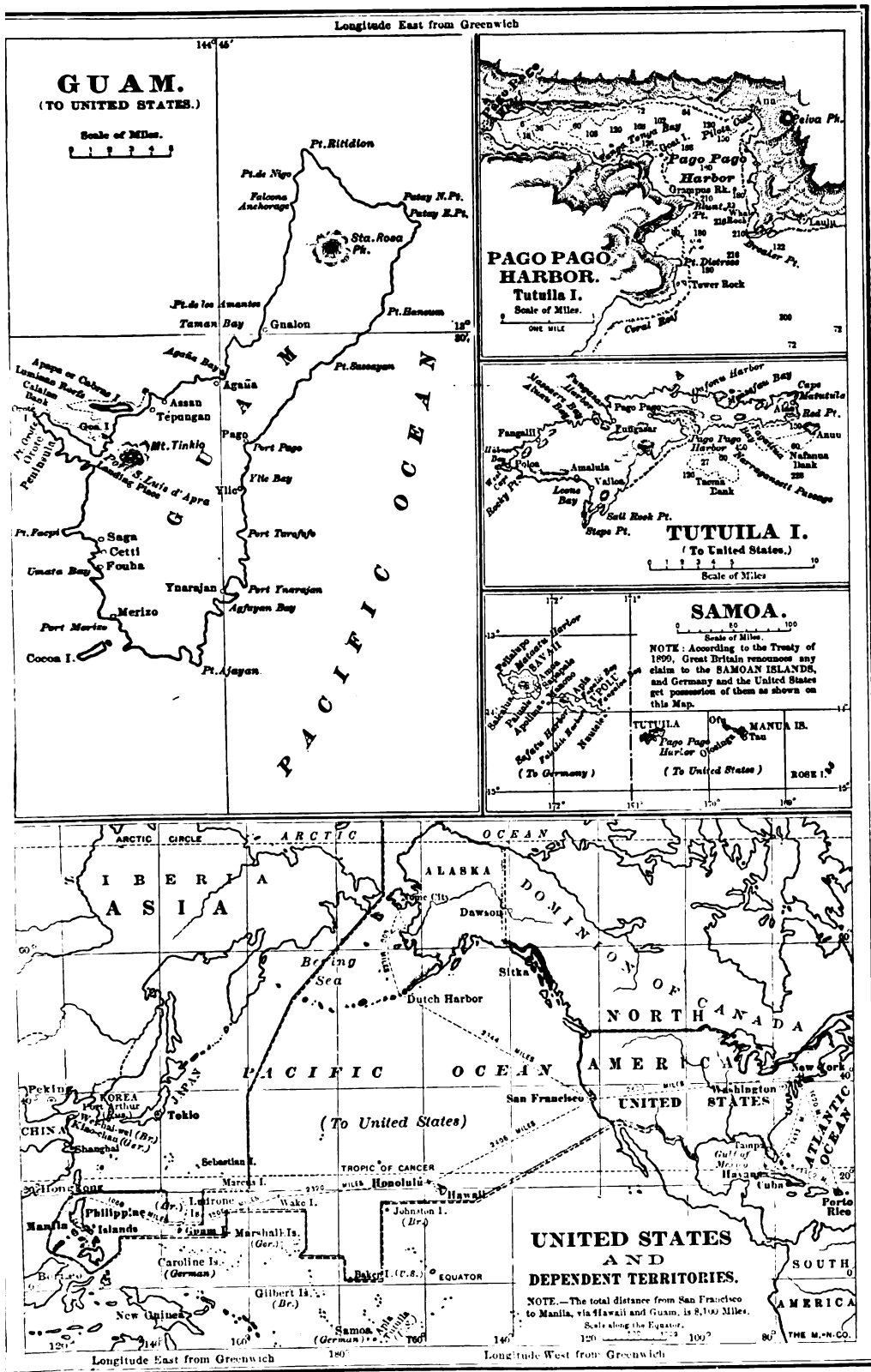
Cabinet and Other Changes.—In December, 1898, the cabinet officers were as follows: Secretary of state, John Hay, of Ohio; secretary of the treasury, Lyman J. Gage, of Illinois; secretary of war, Russell A. Alger, of Michigan; attorney-general, John W. Griggs, of New Jersey; postmaster-general, Charles Emory Smith, of Pennsylvania; secretary of the navy, John D. Long, of Massachusetts; secretary of the interior, Ethan Allen Hitchcock, of Missouri; and secretary of agriculture, James Wilson, of Iowa. The only change in the cabinet during the year was the appointment of Mr. Elihu Root, of New York, as secretary of war, in place of Russell A. Alger, who retired on August 1. Important changes in the diplomatic service were the appointment of Joseph H. Choate, of New York, as ambassador to St. James's; the transfer of Bellamy Storer from the Belgian to the Spanish mission; of Lawrence Townsend from Portugal to Belgium, and of Arthur S. Hardy from Persia to Greece; and the appointment of John N. Irwin, of Iowa, as minister to Portugal, and Herbert W. Bowen, of New York, as minister to Persia.

Foreign Relations.—The most important affair in the foreign relations of the United States during the year was the Alaska boundary dispute (*q. v.*). The Anglo-American commission to consider this and other points of dispute between the United States and Canada reassembled at Washington on November 10, 1898, and adjourned on February 20, 1899, without reaching any basis of agreement in the Alaska boundary matter; but on October 20 a *modus vivendi* was concluded, by which the United States retained possession of the passes leading from tide-water to the Klondike. Another important event was the appointment of the commission under Admiral Walker to make another report for an interoceanic canal route. This new commission, known as the Isthmian commission, was organized on June 10, and proceeded promptly to work on the investigation of the route for the proposed Nicaragua Canal. Several new reciprocity treaties were signed during the year under the reciprocity clause of the Dingley Tariff act of July 4, 1897. In July the President signed conventions of reciprocity with Great Britain for her colonies, British Guiana, Barbados, Bermuda, Trinidad, Jamaica, and Turks and Caicos Islands, and with the republic of Nicaragua. Reciprocity agreements were also formed with France and the Argentine Republic. As to France, a provisional agreement had been formed on May 5, 1898, relieving the French imports into the United States from the operation of the tariff; but in 1899 a new reciprocity treaty was under discussion, according the "most-favored nation" treatment to France. It was signed on July 24, but required ratification from the legislatures of both countries. This treaty was introduced in the French chamber of deputies on December 20, 1899. As outlined in the press, the proposed treaty excluded from the minimum tariff in France the American products of cast iron, leather articles, machine tools, agricultural and cattle products. In France it was claimed that only four per cent. of the American products, to the value of 25,000,000 francs, benefited from the new changes, while 53 per cent. of French products, to the value of 156,940,000 francs, benefited. Diplomatic relations were definitely resumed in the summer of 1899 between Spain and the United States, the Spanish minister having presented his credentials at Washington and the American minister having presented his at the Spanish court. Commercial relations were soon afterward restored by the appointment of consular officers. Friendly relations with Germany, which seemed to be threatened by the popular ill-feeling, caused by the conduct of the admiral of the German fleet in the Philippines, were restored in 1899. There was some controversy in regard to the "most-favored nation" clause in the commercial treaties between Germany and the United States, but reciprocity negotiations were reported to be in progress, and the harmony of the two nations was illustrated by the conclusion of a parcels post agreement, the arrangement for a connecting cable, and the co-operation of the two governments in regard to Samoa. Friendly relations with Italy were temporarily endangered by the lynching of Italian workmen on July 21 in Louisiana. The case was not unlike that which had occurred in 1891, the main difficulty being the responsibility of the United States according to the terms of the treaty with Italy and the embarrassment caused by the independent jurisdiction guaranteed by the constitution to the separate States in dealing with crimes of this character. The citizenship of the victims was investigated, but the matter had not been thoroughly sifted out at the close of the year. The Samoan problem and its successful solution have been described in the article Samoa (*q. v.*). The dangers of the tripartite control of Samoa have long been obvious, and the partition of the islands between Germany and the United States is regarded as in every way the best arrangement. During the year the United States took a definite stand in regard to the "open door" in China. On September 6, 1899, the government entered on a correspondence on this subject with the foreign powers that claimed a sphere of influence in China, sending to each of them a formal declaration, stating the desires of the United States government in regard to the "open door." It requested that the government addressed should declare its intention not to interfere with any treaty port or vested interest within any so-called sphere of influence or leased territory it may have in China; that the Chinese treaty tariff shall apply to all merchandise destined for ports within this sphere of influence, no matter to what nationalities such merchandise belongs, and that the government having a sphere of influence will levy no higher harbor dues on foreign vessels than on its own. The correspondence was still in progress at the close of the year. In the South African war the United States maintained an attitude of strict neutrality, instructing its representative at Pretoria to see that American interests were respected by the combatants. The relations of the government with foreign powers throughout the year were generally satisfactory, but with Turkey they offered an exception to the rule. After the Armenian massacres the United States representative in Turkey was instructed to demand an indemnity for certain property belonging to missionaries, which had been destroyed at Harpoot and Marash. In spite of repeated demands and an apparent acknowledgment of the justice of the claims,

the Porte took no steps to pay the indemnity. Other claims that had been standing for a still longer time were also disregarded, and it was the subject of additional complaint that the Porte refused to recognize the alien status of native Turkish subjects who had been naturalized in foreign countries since 1867. A further complaint was made in respect to the arbitrary treatment of American productions in Turkish ports, where, as the result of certain antiquated tests, American flour in particular was denied entrance on the ground that it was injurious to health. Before the close of the year an agreement was reached with Russia for the submission of her long-standing sealing claims to the decision of a single arbitrator.

War Department Investigation.—In the autumn of 1898 the President, at the request of the secretary of war, appointed a commission to investigate the charges of maladministration which had been made on all sides against the War Department. This commission was in session during the early part of 1899, and rendered its report on February 9. The general purport of this report was to dismiss as unproved the more serious charges against the military administration. It declared that "notwithstanding the haste with which the nation entered into war with Spain, the resulting and almost inevitable confusion in bureau and camp, the many difficulties of arming, assembling and transporting large bodies of hitherto untrained men, the carrying on of active operations in two hemispheres, the people of the United States should ever be proud of their soldiers, who, co-operating with its sailors, in less than three months put an end to Spanish colonial power," etc. At the same time it made some criticisms of several departments in detail, and declared that in the general administration of the War Department there had not seemed to be that complete grasp of the situation which was essential to the highest efficiency and discipline of the army. Some of the arrangements for the transportation of the army were criticised, and the officers who had charge of the loading and unloading of trains were blamed for an inexcusable lack of executive ability. The medical department was censured for its unprepared state when the war broke out. The most serious charges against the administration of the commissary department were dismissed. In general, the evils were attributed to routine methods and lack of preparation, and not to dishonest motives on the part of officers. On December 21, 1898, Major-General Miles testified before the commission that the canned beef supplied to the army was unfit for food, and that the refrigerated beef, which he called embalmed beef, had been treated with chemicals. This testimony brought out an abusive letter from Commissary-General Charles P. Eagan, attacking General Miles in such violent terms that it was not considered fit for publication. General Eagan was tried by court martial on a charge of conduct unbecoming an officer and a gentleman, and was found guilty. The verdict was dismissal from the service, but it was accompanied with a request for executive clemency, and the President commuted the sentence to suspension from rank and duty for six years with pay. A court of inquiry was now established to investigate the charges which General Miles had made before the commission. The court reported that the canned beef was not suitable as a field ration or for use on transports, and that the commissary-general had done an unwarrantable thing in purchasing such enormous quantities of a food that was untried and unknown. But as to the refrigerated beef, the court held that it was a suitable ration for the troops. The court censured General Miles for his failure to report to the secretary of war his belief that the refrigerated beef was unsuitable for the troops. As to the effect of these rations upon the health of the army, the report declared that they could not be regarded as to any appreciable extent the cause of disease among the troops. The findings of the court, in that they reproved the commanding officer, General Miles, for "dereliction of duty," and the commissary-general for "a colossal error," left an unfavorable impression as to the efficiency of the army administration.

Colonial Problem.—For a discussion of some of the main points at issue in regard to the question of our new dependencies, see the article COLONIES, and for a brief record of events in these dependencies themselves see the articles CUBA; PUERTO RICO; the PHILIPPINES; HAWAII; and SAMOA. In the present article reference will be made chiefly to the colonial question in its relation to party issues. Opinion in the United States was sharply divided on the question of the proper policy to pursue toward our newly acquired territories, and the names "expansionists" and "anti-expansionists" or "anti-imperialists" came into general use as roughly indicating the attitude of the respective parties. On February 27 the Democratic caucus in the House of Representatives declared that a colonial policy was contrary to the theory of our government, and demanded that the United States should disclaim any intention of exercising permanent sovereignty over the Philippines. Colonel W. J. Bryan, who was regarded as the certain candidate of the Democratic party in the coming Presidential election, came out in favor of a policy that would first establish a just and independent government in the Philippines, and then leave that government in the hands of the people of the islands. The Anti-Imperialist League



of Boston was conspicuously active in its opposition to expansion. Its members characterized the administration's Philippine policy as not only in violation of the constitution, but wholly out of keeping with the traditions of the country and with rules of justice and morality. One of the ablest opponents of expansion was Senator Hoar, of Massachusetts, who condemned the Philippine policy as mistaken from every point of view. He would not admit that even on the selfish ground of economic interest there was any advantage to the United States in exercising sovereignty over the Philippines, and as to the moral and constitutional objections his attitude was most uncompromising. In an address to the people of the United States a number of prominent anti-imperialists stated very clearly the grounds of their opposition and the course which they desired to see the government pursue. They held that the native government which chose Aguinaldo president and framed a constitution fairly represented the intelligence of the people, and they declared that President McKinley's assumption of power in the Philippines in his proclamation of January 5, ordering General Otis to extend the military government of the United States to the whole of the ceded territory, was unwarrantable and greatly exasperated the people of the islands. They demanded that the government should suspend hostilities in the Philippines, hold a conference with the Philippine leaders to insure peace, and tender an official promise to the natives that as soon as a government should be organized in the islands the United States would recognize their independence and gradually withdraw its military and naval forces. On the other hand, the President's speeches and those of members of his cabinet indicated a firm belief that the retention of the Philippines was desired by the great majority of Americans. In an address on February 16 the President declared that it would have been a weak evasion of our duty if we had required Spain to transfer the island to some other power or powers. The only alternative was for the United States or Spain to possess them, and it was inconceivable that they should be abandoned to their fate. The Philippines had been committed by the treaty to the guidance of the United States, and until Congress should direct otherwise it would be the President's duty to hold the islands and strive so far as possible to establish peace and order there. It was the opinion of a very large number of people, even including those who regretted the acquisition of the Philippines, that the policy of the administration was the only possible course. They distrusted the government of Aguinaldo, and were certain that a condition of anarchy would follow the withdrawal of American control. They held that without our desiring it the responsibility for the future of the Philippines had been thrust upon us, and that the only thing to do was to retain control, and work for the establishment of a stable government there. Others, however, favored the retention of the Philippines precisely because it was a movement toward expansion, and marked the entrance of the United States upon the great work of extending its civilization. In other words, they frankly held the view that was characterized by their opponents as imperialism.

Ratification of the Treaty of Paris.—The treaty of peace, signed by the Spanish and American commissioners in Paris on December 10, 1898, was sent to the Senate by President McKinley on January 4, 1899, and after a long discussion was formally ratified by that body on February 6 by a vote of 57 to 27. The opposition to the treaty, led by Mr. Gorman (Dem.), of Maryland, and Mr. Hoar (Rep.), of Massachusetts, directed its attacks chiefly against those clauses that provided for the annexation of the Philippines. The treaty was signed by President McKinley on February 10 and by the Queen Regent of Spain on the 17th of the following month, and on April 17 the ratifications were formally exchanged at Washington, M. Jules Cambon, the French ambassador, acting in behalf of Spain. The treaty did not bind the United States government to any definite policy in regard to the Philippines, but left their final status—either that of a colony, a territory, a protectorate, or an independent government—to be determined subsequently by Congress. Besides the 87 senators voting on the treaty there were 2 opposed to it paired with 4 against. The opponents comprised 24 Democrats, 2 Republicans (Hoar, Massachusetts, and Hale, Maine), 2 Populists (Heitfield, Idaho, and Turner, Washington), and 1 Silver Republican (Pettigrew, South Dakota). The supporters comprised 42 Republicans, 10 Democrats, 3 Populists (Butler, North Carolina; Allen, Nebraska; Harris, Kansas); 3 Independents (Cannon, Utah; Kyle, South Dakota; Teller, Colorado); and 2 Silverites (Jones and Stewart, Nevada). After the ratification of the treaty the Senate adopted a resolution, introduced by Mr. McEnery (Louisiana), stating that by ratification it was not intended to extend citizenship to the Filipinos or permanently to annex the islands. It was generally recognized, however, that this action of the Senate could have no binding force on future Congresses. Mr. McEnery, Mr. Jones (Nevada), and Mr. McLaurin (South Carolina) were the three senators who just before the final vote went over from the opposition to the supporters of the treaty, and thus insured its ratification.

The Philippine Commission.—At the beginning of 1899 there existed in the public mind an uncertainty, due largely to ignorance of the Philippines, as to what the course of the United States toward them should be. Accordingly, President McKinley appointed a commission of investigation the names of whose members were announced on January 17: Jacob Gould Schurman, president of Cornell University, chairman; Admiral Dewey, Professor Dean C. Worcester, of the University of Michigan, Mr. Charles Denby, and General E. S. Otis. Early in April this commission issued a proclamation to the Filipinos, extending to them the good will of the American people, but insisting upon American authority. On November 3, 1899, the preliminary report of the Philippine Commission was published. It was signed by all of the commissioners except General Otis, who remained in Luzon throughout the year. The report was regarded as a very strong argument in favor of the administration's policy in the Philippines. It gives an account of the events leading up to the Filipino attack of February 4, stating that at no time after Dewey's victory in Manila Bay had it been advisable to withdraw American authority, and that the Filipino attack was not justifiable. The report stated that "no alliance of any kind was entered into with Aguinaldo," and that there was no promise of independence made to him either when Dewey brought him to Manila or at any other time. The commissioners were convinced that the Filipino plans for attacking the Americans dated from the time when troops were first landed by General Anderson. It was also shown that practically the Tagalogs of Luzon were the only rebels, and that the Filipinos in general are unfit for purely self-government. The commissioners were convinced that the duty of the United States government lay in thoroughly repressing the insurrection in the islands, and in maintaining there law and order.

The Philippine Insurrection.—Before the commissioners (excepting Dewey and Otis) arrived at Manila, the Filipinos had made a general attack on the American forces before the city. General Otis, who from August, 1898, and throughout 1899 was commander-in-chief of the troops in the Philippines and military governor-general of the islands, had exercised much care and forbearance in striving to avoid friction between the American soldiers and the natives who had served under Aguinaldo against the Spaniards. Aguinaldo was determined upon Filipino independence, and had set up a nominal native government. About the 20th of January the Filipino congress at Malolos had empowered Aguinaldo to make war on the Americans at any time he might deem it advisable. On the night of February 4 a number of Filipinos made a deliberate attempt to cross the American lines, and, refusing to return at command of the sentry, were fired upon. This seemed to be the signal for the Filipino attack, which continued fiercely with some intermissions until the next day. Some of the United States vessels in Manila harbor assisted the army by shelling the insurgents. General Otis then directed an advance of the entire American line, which extended some seventeen miles, and the Filipinos were soon pushed back some six miles from Manila, losing the villages of San Pedro, Santa Ana, San Juan del Monte, Santa Mesa, Lomia, and Macati. On February 7 General Otis reported that the insurgents numbered about 20,000 and were well armed, that the American casualties were about 250, and that the Filipinos lost some 3500 in killed and wounded, besides 500 prisoners. On February 10 the insurgents, who had been gathering at Caloocan, were driven out of that town by the brigade of Brigadier-General H. G. Otis, of General MacArthur's division. Up to February 11 the total American casualties recorded were 57 killed and 215 wounded. By the next day a cordon had been established around Manila, reaching from Caloocan, on the north, for nearly thirty-five miles, through San Francisco del Monte, San Juan del Monte, Santolan, and San Pedro Macati to Manila Bay, near Pasay.

There was little aggressive campaigning on the part of the Americans from the time of the battle of Caloocan to nearly the middle of March. General E. S. Otis waited for reinforcements, and then organized expeditions under Generals MacArthur, Lawton, Wheaton, and Hall. In the meantime the Filipinos made two unmilitary and dastardly attempts against the Americans. On February 15 there was issued from Malolos an order for the assassination of all foreigners in Manila, but the plot could not be carried out. At about the same time General Charles King engaged a band of insurgents and drove them back beyond Guadalupe. The other Filipino attempt was that of burning Manila; it happened, however, that they succeeded in destroying only that part of the city inhabited by Filipinos. The loss amounted to about \$1,000,000.

During March 13-19 General Wheaton made an expedition north beyond Pasig, thus piercing the insurgent lines, and having captured several towns established a garrison at Pasig. From the 25th to the 31st of March General MacArthur, having in command under him Generals Wheaton, H. G. Otis, Hale, and Hall, advanced against the Filipinos, who were commanded by General P. Garcia, with Aguinaldo in the rear, and after some hard fighting and the capture of several towns, including Malabon, he occupied Malolos, at that time the insurgent capital, on March 31. In

each of the fights of this expedition the insurgents fled, and upon entering Malolos General MacArthur found that Aguinaldo had escaped, together with his government. San Fernando was then made the Filipino capital. It was in this series of engagements that Colonel H. C. Egbert, of the Twenty-second Infantry, and Prince Ludwig Karl Loewenstein, who was with the American troops, were killed. The next expedition sent out by General E. S. Otis was that of General Lawton, who had arrived at Manila on the transport *Grant* on March 10. His first campaign took place during April 8-17, when he conducted a flotilla expedition across Laguna de Bay and captured several towns, including the city of Santa Cruz.

An important expedition was now undertaken by General MacArthur from Malolos to Calumpit and San Fernando during April 25-May 5. General Hale's brigade comprised the centre of the advancing column, and General Wheaton was on the left, while General Lawton conducted an almost independent expedition on the right, finally joining MacArthur's division at Balinag on May 1. In MacArthur's expedition several towns were captured, the Filipinos constantly retreating after engagements. The most noteworthy battle was at Calumpit, where Colonel Funston, of the Twentieth Kansas, gained distinction from the part he took in capturing the town, April 27. General Lawton's "flying column" did some remarkable work, engaging in 22 fights and taking 28 towns in 20 days. Aguinaldo had made San Isidro his capital, but this town being abandoned by the Filipinos, the seat of the so-called insurgent government was transferred to Tarlac. Commander-in-Chief E. S. Otis, who directed the American movements from his headquarters in Manila, now determined to transfer his aggressive campaigning from the north of Manila to the east and south, General Lawton being placed in command. A detachment took Morong on June 5. General Lawton, with General Wheaton and General Owenshine as brigade commanders, proceeded south against the Filipinos, who while the operations were progressing in the north had been intrenching themselves at Bacoor, Paranaque, Zapoti, and Imus. The great heat of the tropical summer caused the American advance to be deferred until June 10. The insurgents were engaged on each day from this date to June 13, when the most severe fight—at Zapoti Bridge, near Bacoor—took place. Here, it is said, the insurgents numbered some 4000, of whom about one-third were lost in killed, wounded, and captured. The Filipinos were further routed by General Wheaton's brigade. General Lawton next directed a movement on Laguna de Bay.

For a number of weeks—up to August 9—American aggression was delayed by the difficulties due to the tropical rainy season. From the 9th to the 16th of August General MacArthur conducted an expedition from San Fernando north to Angeles, this town being occupied on the latter date. Under MacArthur were General Liscum on the left and General Wheaton on the right. The advance was attended with great difficulties. In the meantime troops under General Samuel B. M. Young routed the insurgents from San Mateo.

During the autumn hostilities in Luzon continued, but the fighting, though sharp at times, was in general more desultory. A large number of engagements took place, in all of which the Americans were victorious, but though in the later months of the year organized rebellion seemed to be broken, insurgent outbreaks repeatedly occurred in districts that were thought to be pacified or at least under American subjection. On October 1 Aguinaldo, who twice before during the year had attempted to confer through his representatives with General Otis, sought to obtain a conference for bringing about a cessation of hostilities. His tone, however, as before, indicated his insistence upon a recognition of the Filipino "republic," and, accordingly, his overtures came to nothing. Among the more noteworthy of the engagements during October were those near Imus and Angeles. November marked continued American advance in the north. On the 8th of the month the forces of General MacArthur occupied Mabacalat, and on the day before General Wheaton had succeeded in landing his force of 2700 men at San Fabian. At the same time operations under General Lawton were being carried on in the province of Nueva Ecija. On November 10 Aguinaldo again changed the seat of his government—this time from Tarlac to Bayombong; two days later the former town was occupied by the American troops. A number of engagements took place about the middle of the month, and on the 17th General MacArthur entered Gerona and two days later General Wheaton occupied Dagupan. A week later reports came that though Aguinaldo was succeeding in eluding the Americans, his government was disorganized and the insurrection practically broken. American successes continued in December in northwestern Luzon, and on the 26th of that month General Young was appointed military governor of the district, with headquarters at Vigan. In the meantime the American cause suffered a severe blow in the death of General Lawton, who was shot while leading a successful attack at San Mateo, province of Manila. Before the end of the year it was believed by many in the United States that the independent government which the Tagalogs were seeking to establish was in nowise

representative of the islands, and was little more than a despotism of the Tagalog leaders, of whom Aguinaldo was the head. On the other hand, the anti-imperialists believed the resistance was a genuine popular movement against the establishment of alien rule.

Though the most active interest in the establishment of American authority centred in Luzon, important measures were taken in several of the other large islands during the year. On February 11 Iloilo, capital of the island of Panay, was occupied after a bombardment, in which there were no American casualties. The city of Cebu was taken on the 26th, and on March 1 a military district, comprising the islands of Panay, Cebu, and Negros, was established, and put under the supervision of General Marcus P. Miller. Bacolod, on Negros, was then occupied by the Americans under J. F. Smith without opposition. Negros was the first island to accept American sovereignty, and a provisional government was established there in the summer. It consisted of a military governor, appointed by the governor of the Philippines, and a civil governor and advisory council elected by the people. In November slight engagements in Panay and Cebu were reported. In the same month United States authority was extended over the southern half of Mindanao. In December a native outbreak in Negros was reported. It was conceded that there would be little difficulty in establishing American authority in the islands other than Luzon were it not for the influence of the Tagalogs.

The United States troops in the Philippines in November, 1899, according to the report of the secretary of war, dated on the 29th of that month, comprised "905 officers and 30,578 men of the regular force and 594 officers and 15,388 men of the volunteer force, making an aggregate of 1499 officers and 45,966 men;" with the arrival of the troops then *en route* the total force would number 2051 officers and 63,483 men. The deaths in the army in the Philippines from January 1 to November 1, 1899, including those killed in battle and dying of wounds and other injuries, aggregated 477, while those dying of disease numbered 366, the total being 843. The secretary of war calls attention to a comparison of the death-rates in several American cities and the death-rate of American soldiers in the Philippines. The annual death-rate per 1000 is stated to be: Washington, 20.74; Boston, 20.09; San Francisco, 19.41; New York, 19.28; Baltimore, 19.10; soldiers in the Philippines, 17.20.

The Sulu Treaty.—A conditional agreement made by General Bates with the Sultan of Sulu in August was submitted to the Senate in December, and its text was made public on December 13. The chief features of the agreement were as follows: The sovereignty of the United States over the archipelago of Sulu and its dependencies; the recognition of the rights and dignities of the Sultan and of the religious customs of the Moros; the right of the United States to control such points in the archipelago as public interests seemed to demand, except that the land immediately about the residence of the Sultan is not to be encroached upon, except in cases of military necessity in connection with a war with a foreign power; free trade between the archipelago and any portion of the Philippine Islands when conducted under the American flag; prohibition of the introduction of firearms and war material; the co-operation of the Sultan in the suppression of piracy; the trial of criminals by the authorities of the United States, except where crimes and offences are committed by Moros against Moros; the right of any slave in the archipelago to purchase his freedom by paying to his master the usual market value; American protection to the Sultan and his subjects in case of aggression on the part of a foreign nation; non-alienation by the United States of any island of the archipelago to a foreign nation without the consent of the Sultan; the payment of a monthly stipend to the Sultan and to some of his chief officials.

Cuba.—After the withdrawal of Spanish authority from the island of Cuba on January 1, 1899, the United States officials set to work to improve the administration by the introduction of sanitary reforms, by the promotion of industry and trade, and by the spread of education. The President, in his December message, renewed the pledge contained in the resolution of Congress, passed just before the Spanish-American war, that the United States disclaimed any intention of exercising sovereignty or control over Cuba, except for the pacification of the island, and declared that this pledge was in the highest degree obligatory. The treaty of peace allowed the Spanish people on the island till April 11, 1900, to decide whether they would remain citizens of Spain or become citizens of Cuba. An order was issued for the taking of a census on August 19, with the expectation of arranging for elections after the census returns should have been tabulated. The declared intention of the administration was to permit the establishment on the island of a representative and independent government as soon as it seemed practicable. See CUBA.

Puerto Rico.—The insular commission, appointed by the President to make recommendations in regard to the civil government of the island, rendered its report to the secretary of war on August 30. It recommended the substitution of civil

government for the military rule, and suggested a code of laws. The new government was to be administered wholly by natives, the higher officers to be chosen by the President and the lower by the governor-general and the county commissioners. The new civil government did not give the natives the elective franchise or the right of trial by jury, except for felony involving amounts in excess of \$500, which cases should be tried in United States courts. In the commission's preliminary report, rendered on May 27, 1899, it was asserted that radical and immediate reforms were necessary for the protection of the people and the upbuilding of the island. The new laws were based on the common law of the United States on the ground that while the Spanish system was not entirely bad, it would render it difficult to Americanize Puerto Rico or give it the benefit of a complete judicial system on the American plan. The commission recommended that all the Spanish laws applicable to Puerto Rico should be set aside and the common law of the United States be established in their place. In his December message the President dwelt on the need of promptly establishing a civil government in Puerto Rico, and recommended the application of the principle of local self-government, though not advising the committal of the entire government of the island to officers selected by the people. As to taxation, he said: "Our plain duty is to abolish all customs tariffs between the United States and Puerto Rico, and give her products every access to our markets." It was stated, however, in the report of Brigadier-General Davis on the industrial and economic conditions of Puerto Rico that the removal of all trade restrictions between the island and the United States would, if it involved the application to Puerto Rico of the United States revenue laws, mean a loss to the island of the principal sources of revenue on which it had relied. He pointed out that if the island were to receive no direct benefit from customs and internal revenue taxation, "local expenditures must be provided for by property and income taxes," and he added that "under existing conditions not one-quarter of the revenue needed could be collected through the present machinery." The question of civil government in Puerto Rico and of the system of taxation to be adopted were still pending at the close of the year.

The Trust Problem.—The question of regulating trusts was a subject of much discussion during the year, and in some quarters there was an effort to make it a national political issue. Party lines, however, were not distinctly drawn in this matter. Some of the prominent Democrats referred to a definite anti-trust issue as likely to form a plank in the Democratic platform in the Presidential election, and Mr. Bryan toward the close of the year declared that the three principles for which he stood were anti-trusts, anti-imperialism, and free silver. On the other hand, there were many Republicans who emphasized the dangers of trusts, and the President, in his December message, declared that the subject ought to receive the attention of Congress. Though pointing out the evils of combinations of capital to control the market and crowd out competition, he did not recommend any definite measure of relief, though he suggested that if the present law could be so extended as better to control or check monopolies or trusts, it should be done without delay. State legislation on the subject had failed to accomplish its object, owing chiefly to the fact that different views as to the nature of these combinations were taken in different States. The industrial commission, established on June 18, 1898, continued its investigation into the subject of combinations in restraint of trade and competition. See TRUSTS and ECONOMIC ASSOCIATION, AMERICAN.

Pacific Cable.—In a special message of February 10, 1899, the President pointed out the need of a Pacific cable to connect our island possessions with our western coast, and the matter was the subject of much discussion during the year. A Pacific cable was proposed by Cyrus W. Field nearly thirty years ago, but especial interest in the project has been aroused by our recent acquisitions in the Pacific. Present communications with the Philippines are by way of England, France, Egypt, India, and China, and messages can be transmitted only at great cost. In his annual report the secretary of war says: "A very thorough investigation recently made by Great Britain preparatory to the laying of a trans-Pacific cable between British Columbia and Australasia has demonstrated beyond question the practicability, not only of the cable proposed by Great Britain, and for which bids are now being received [November, 1899] but of a cable between California and the Philippines via Hawaii, Wake Island, and Guam. The length of such a cable would be 7493 miles, as against 7086 miles for the proposed British cable, and the cost is estimated by the United States Signal Office as not exceeding \$8,500,000 at the present market rates for material." In 1899 a survey was made of a cable route from Honolulu to the Philippines, the route from San Francisco to Honolulu having been surveyed in 1892. This cable would not take the shortest route, but it would touch only at points under the control of the United States, thus satisfying the claim of those who demand an "all-American" route.

Federal Judiciary.—The following were among the most important decisions

rendered by the Supreme Court in 1899: On January 16 the court sustained a State law which abridged the right of jury trial in civil cases. On January 16 it sustained another State statute by which fire insurance companies were required to pay the full amount for which property was insured in cases of total loss. On April 3 the court decided that the tax on transactions of boards of trade, exchanges, etc., under the 1899 War Revenue act was constitutional, being an indirect and uniform tax. Two important decisions in regard to national banks were rendered—one on April 3, denying to the State legislatures power to tax national banks, and the other on May 15, denying the right of one national bank to invest its capital in the stock of another. A decision on May 15 held that the conflict of an act of Congress with a treaty with an Indian tribe did not injure its validity. A most important decision on the subject of trusts, which has already been noted in the article on Trusts (*q. v.*), was the Addyston Pipe case. The questions brought before the Supreme Court were whether the constitutional clause for the regulation of interstate commerce applied to individuals and corporations; and whether, if the clause did so apply, the Addyston Pipe combination was in restraint of interstate commerce. The court decided both these points in the affirmative on December 4, 1899.

The November Elections.—Elections were held in the following twelve States: Iowa, Kentucky, Maryland, Massachusetts, Mississippi, Nebraska, New Jersey, New York, Ohio, Pennsylvania, Virginia, and South Dakota, of which the first five chose a complete set of State officers, including the governor, while the others had only to choose State officials of more or less importance. As to the significance of these elections in showing the probable character of the campaign of 1900, there was naturally a divergence of opinion corresponding to party affiliations. The party platforms adopted in the States where elections were held seemed to show that the issues of 1896 will continue to divide parties in 1900. The Republican platforms continued to uphold the gold standard, the policy of protection, the building up of a navy and a merchant marine. The Democrats still insisted upon the unlimited coinage of silver at 16 to 1 and the establishment of free trade. In the main, each party renewed the principles of its national platform of 1896. On the whole, the popular attitude seemed to indicate a suspension of judgment on the vital national questions involved in our relations with the Philippines and with the other territories acquired by the Spanish-American war. Although there was in certain quarters a vigorous arraignment of the administration's policy, there seemed to be a general inclination to await further developments and to give that policy a chance to operate. See the articles on the separate States.

UNITED STATES DAUGHTERS OF 1812, founded in 1892, is composed of women above the age of 18 years, who are lineal descendants of ancestors who rendered civil, military, or naval service during the War of 1812. President-general, Mrs. William Gerry Slade; secretary-general, Mrs. Leroy S. Smith, 322 West Eighty-seventh Street, New York City.

UNIVERSAL BROTHERHOOD, founded in 1898, being the outgrowth of the Theosophical Society, which now constitutes the literary department of the Universal Brotherhood, has for its object the teaching of brotherhood and the toleration of all accepted religions. It has 150 lodges in the United States and Canada, and others in many countries of Europe and Asia. It includes also the International Brotherhood League, which has practical humanitarianism for its object. General secretary, Frank M. Pierce, 144 Madison Avenue, New York City.

UNIVERSALISTS, a sect of Christians, report for 1899, 760 ministers, 776 churches, 46,522 members, and church property amounting to \$9,623,762. At the convention, held in Boston, Mass., a committee of five was appointed to meet with a similar committee of the Unitarians (*q. v.*), and the home missionary operations were placed under a general superintendent and a council of superintendents.

UNIVERSITIES AND COLLEGES. The year covered by the last annual report of the United States Commissioner of Education (1897-98), on which the following statistics are based, was a prosperous one for the universities and colleges of the country, showing an increase in attendance of 3924. The total number of students in collegiate, graduate and professional departments of institutions for higher education and in professional schools was 144,477: 43,419 were professional students of law, medicine, and theology; 101,058 were students of the liberal arts and of technology. The graduate students numbered 5514, an increase of nearly 600 over the preceding year, showing an increased demand for special studies in science, sociology, politics, jurisprudence, and similar topics. The total amount of money invested in universities, colleges, and schools of technology was reported to be \$311,842,428, which is about \$16,000,000 more than the amount reported for the preceding year. The total income of these institutions was \$25,963,242. Gifts and bequests were received in 1899 amounting to \$8,204,281. See EDUCATION IN THE UNITED STATES.

UNIVERSITIES AND COLLEGES.

The following table of universities and colleges in the United States is compiled from the last report of the United States Commissioner of Education, and from catalogues and other data received directly from the institutions. Colleges for men only are designated A; for both men and women, B; and for women only, C.

NAME.	LOCATION.	PRESIDENT.	Denomination.	Organized.	Officers of Instruction.	Students.	Collegiate Expenses.	Bound Volumes in Library.	Value of Buildings, Grounds and Library.	Amount of Productive Funds.
B Add-Ran Christian Univ.	Waco, Tex.	Adison Clark, LL.D.	Christ.	1873	14	238	\$ 60	2,000	\$ 150,000	0
B Adelphi College.	Brooklyn, Borough, N. Y.	C. H. Levermore, Ph.D.	None.	1868	45	800	170	7,000	493,000	0
B Adrian College.	Adrian, Mich.	David Jones, D.D. (act.).	M. P.	1869	15	126	45	6,000	175,000	50,000
B Ag. and Mech. Col. for Colored Race.	Greensboro, N. C.	James B. Dudley.		1884	10	117		714	42,000	0
B Ag. and Mech. Col. of Texas.	College Station, Tex.	R. H. Whitlock.		1876	23	337	0	5,000	346,355	202,000
B Alabama Bapt. Colored Univ.	Selma, Ala.	C. S. Dinkins, D.D.	Bapt.	1878	10	240		500	25,000	0
B Ala. Conference Female Col.	Tuskegee, Ala.	John Massey, A.M., LL.D.	M. E.	1855	13	134	50	2,500	85,000	0
B Ala. Polytechnic Institute.	Auburn, Ala.	W. LeRoy Brown, M.A., LL.D.	None.	1873	32	300	0*	12,932	160,000	253,500
B Alabama, University of.	University, Ala.	Jas. K. Powers, LL.D.	None.	1881	32	318	40†	15,000	800,000	200,000
C Albemarle College.	Charlottesville, Va.	L. H. Shuck, D.D.	None.	1897	11	71	60	1,000	150,000	0
C Albert Lea College.	Albert Lea, Minn.	Miss Virginia Southgate, Prin.	Presb.	1885	7	47	34	2,000	25,000	25,000
B Albion College.	Albion, Mich.	J. P. Ashley, S.T.B., Ph.D.	M. E.	1843	28	248	21	11,600	80,000	208,000
B Alcorn Ag. and Mech. Col.	Westside, Miss.	Rev. E. H. Triplett.		1871	14	248		3,530	63,750	98,373
B Alfred University.	Alfred, N. Y.	Rev. B. C. Dawford, Ph.D.	7th-D. Bapt.	1888	32	319	38	11,728	90,000	983,745
B Allegheny College.	Meadville, Pa.	Wm. H. Crawford, D.D.	M. E.	1817	23	326	51	17,500	200,000	200,000
B Allen University.	Columbia, S. C.	D. H. Johnson, D.D.	A. M. E.	1861	12	277	65	200	85,000	0
B Allentown College for Women.	Allentown, Pa.	J. W. Kuappenberg, A.M.	Reformed.	1887	14	108	60	700	60,000	0
B Alma College.	Alma, Mich.	A. F. Kruske, D.D., LL.D.	Presb.	1867	16	128	42	15,312	100,000	80,000
B American Temperance Univ.	Hartman, Tenn.	J. F. Spence, D.D.	None.	1868	21	235	70	1,000	100,000	5,000
B Amherst College.	Amherst, Mass.	George Harris, D.D.	Cong.	1821	34	372	110	71,780	800,000	1,400,000
B Andover Female College.	Andover, Mass.	Rev. J. C. Galhoun, A.M.	None.	1853	17	158	80	2,000	40,000	30,000
B Andover Theological Sem.	College Springs, Ia.	George F. Moore (Pres. of the Faculty).	None.	1863	7	122	150	51,000		
B Androch College.	Cuthbert, Ga.	Rev. Homer Bush, A.M.	None.	1864	12	173	40	500	80,000	0
B Arizona, University of.	Yellow Springs, O.	D. A. Long, D.D.	M. E. So.	1854	17	112	58	6,000	100,000	70,000
B Arkadelphia Meth. Col.	Tucson, Ariz.	M. M. Parker, A.M.	None.	1891	14	157	5	3,400	85,000	0
B Arkansas College.	Batesville, Ark.	Caldesman Pope.	M. E.	1860	6	138	52	500	25,000	5,500
B Arkansas Cumberland College.	Clarksville, Ark.	Eugene R. Long, A.M., Ph.D.	Presb.	1872	6	108	65	2,500	25,000	15,000
B Arkansas Indust. University.	Clarksville, Ark.	J. A. Laughlin (Chair).	Cumh. Presb.	1891	7	88	46	8,000	280,000	180,000
B Art Institute of Technology.	Chicago, Ill.	F. W. Gunsaulus, D.D.	None.	1873	19	606	6	7,908	2,000,000	
B Asheville Female College.	Asheville, N. C.	A. A. Jones, A.B.	None.	1863	70	1,022	75	15,000	100,000	
B Athens Female College.	Athens, Ala.	Rev. H. W. Browder, A.M.	None.	1854	16	153	100	1,000	85,000	0
B Atlanta Baptist College.	Atlanta, Ga.	Rev. George Sato, A.M.	M. E. So.	1842	13	165	50	1,000	75,000	20,000
B Atlanta University.	Atlanta, Ga.	Horace Bumstead, D.D.	Bapt.	1867	10	150	16	2,000	250,000	35,000

* To residents. † To non-residents.

Sex.	NAME.	LOCATION.	PRESIDENT.	Denomination.	Organized.	Officers of Instruction.	Students.	Collegiate Expenses.	Bound Volumes in Library.	Value of Grounds and Buildings.	Amount of Productive Funds.
A	Auburn Theol. Seminary.....	Auburn, N. Y.	Geo. B. Stewart, D.D.	Presb.	1820		89	\$ 25	36,000	\$ 300,000	\$ 600,000
A	Augsburg Seminary.....	Minneapolis, Minn.	George Steyerup	Luth.	1869		194	37	1,000	100,000	30,000
A	Austria College.....	Rock Island, Ill.	O. Olson, D.D.	Luth.	1860		283	36	16,000	210,000	60,000
B	Austin College.....	Edgingham, Ill.	W. E. Lingenbeel, Ph.D.	None.	1861		310	32	2,000	30,000	0
B	Austin College.....	Sherman, Tex.	T. R. Sampson, D.D.	Presb.	1868		94	61	8,000	40,000	60,000
B	Aulton College.....	Baltimore, Md.	A. B. Kuntler	U. B.	1868		60	50	560		
B	Baylor College.....	Baylor Springs, Ala.	A. B. Kuntler	U. B.	1868		60	50	560		
B	Baylor Springs University	Baldwin, Kan.	Rev. L. H. Morrin, S. T. B., Ph.D.	None.	1893		45	50	1,000	35,000	0
B	Baker University.....	Berea, O.	M. E.	M. E.	1858		512	23	6,000	100,000	0
B	Baldwin University.....	Berea, O.	W. F. Warner, A. M., D.D.	M. E.	1846		238	36	5,000	120,000	77,000
B	Bangor Theological Seminary.....	Bangor, Me.	J. L. Chapman, D.D. (Pres. Bd. of Trus.)	Cong.	1816		18	20	2,000	100,000	17,500
B	Baptist Female College.....	Lexington, Mo.	James A. Beauchamp	Bapt.	1855		90	50	50,000	50,000	0
B	Barnabaz College.....	Carrollville, W. Va.	J. P. Marshall, V. P.	M. E. So.	1888		70	42	600	50,000	0
B	Barnard College.....	Manhattan Borough, N. Y. C.	Emily J. Smith, A. B. (dean)	None.	1889		238	150	1,000	500,000	0
B	Bartolomew Eng. and Class. School.	Cincinnati, O.	C. K. Bartholomew, Ph.D.	P. E.	1875		148	160	1,000	35,000	0
B	Bates College.....	Leicester, Me.	Geo. C. Chase, D.D.	Free Bapt.	1868		209	67	18,500	200,000	350,000
B	Baylor Female College.....	Battle Creek, Mich.	L. A. Sutherland	7th-D. Adv.	1872		30	52	3,000	160,000	0
B	Baylor Female College.....	Battle Creek, Mich.	W. A. Wilson, A. M.	Bapt.	1845		12	58	1,100	100,000	0
B	Baylor Female College.....	Waco, Tex.	J. C. Lattimore, Ch., M. S.	Bapt.	1845		51	53	8,000	200,000	0
B	Belhaven Col. for Young Ladies	Jackson, Miss.	Lewis T. Fitzhugh, A. M.	None.	1864		140	250	800	40,000	0
B	Beloit College.....	Beloit, Wis.	Wm. G. Frost, D.D.	Cong.	1847		409	23	24,060	335,000	418,738
B	Berea College.....	Berea, Ky.	D. K. Eaton, D.D.	None.	1855		23	405	14	114,000	101,568
B	Bethany College.....	Lindsborg, Kan.	Rev. C. Swenson, D.D.	Luth.	1881		14	308	40	130,000	0
B	Beth-a College.....	Russellville, Ky.	C. A. Young, Ph.D.	Christ.	1841		94	40	3,000	200,000	0
B	Bethel College.....	McKenzie, Tenn.	E. S. Alderman, D.D.	Bapt.	1864		89	55	5,000	69,500	88,000
B	Bethel Female College.....	Hopkinsville, Ky.	Rev. J. L. Dickens, Ph.D.	Cumb. Presb.	1850		202	50	1,000	18,000	0
B	Biddle University.....	Charlotte, N. C.	Rev. Edm. Harrison, A. M.	Bapt.	1864		10	103	50	50,000	100
B	Blackburn University.....	Carlisle, Ill.	D. J. Sanders, D.D.	Presb.	1868		12	374	8,500	180,000	7,000
B	Black Hills College.....	Hot Springs, S. D.	W. H. Bradley, A. M. (act.)	Presb.	1869		9	82	37	50,000	36,000
B	Blount College.....	Bloomsville, Ala.	Rev. E. L. Lymmer, M. S., D. D.	M. E.	1869		64	30	3,000	36,000	32,000
B	Blue Mountain Female College.....	Blue Mountain, Miss.	J. L. Bialock, A. M.	None.	1860				600		
B	Blue Mountain Female College.....	Blue Mountain, Miss.	B. G. Lowrey	None.	1873		15	50	1,500	40,000	0
B	Bordentown Female College.....	Bordentown, N. J.	J. W. Blaisdell, D.D.	None.	1833		16	68	3,000	36,000	0
B	Boston College.....	Boston, Mass.	Rev. T. Brosnan, S. J.	R. C.	1864		90	477	60	400,000	0
B	Boston University.....	Boston, Mass.	W. F. Warren, S. T. D., LL.D.	M. E.	1863		1,454	110	31,000	840,000	981,000
B	Bowdoin College.....	Brunswick, Me.	W. D. Hyde, D.D.	None.	1794		38	183	61,683	500,000	693,000
B	Bowdoin College.....	Bowdoin, Ga.	Vachel D. Whately	None.	1867		8	109	36	5,000	
B	Bridgewater College.....	Bridgewater, Va.	W. B. Yount	Bapt.	1863		1	190	8	9,000	11,000
B	Brighton Young College.....	Logan, Utah.	Wm. J. Kerr, B. S., B. D.	L. D. S.	1873		78	298	7,800	45,000	93,487
B	Brown University.....	Providence, R. I.	W. H. F. Faunce, D. D.	None.	1764		73	640	150	1,777,987	807,481
B	Brownsville Female College.....	Brownsville, Tenn.	C. A. Folk, A. B.	Bapt.	1861		8	60	50	13,500	0
B	Bryn Mawr College.....	Bryn Mawr, Pa.	M. Carey Thomas, Ph.D.	None.	1865		41	923	100	800,000	1,000,000
B	Bucksport College.....	Bucksport, A. P.	Rev. A. A. Fries	U. B.	1866		1	179	46	7,000	200,000
B	Bucknell University.....	Lewistown, Pa.	J. H. Harris, LL.D., Ph.D.	Universalist.	1872		84	179	46	16,000	400,000
B	Bucknell University.....	Lewistown, Pa.	J. H. Harris, LL.D., Ph.D.	Bapt.	1846		430			300,000	

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B	Buena Vista College.	Storm Lake, Ia.	Harvey Hostetler, A.B.	Presb.	1891	7	96	\$4	500	\$ 40,000	\$ 0
B	Burrill College.	Spencer, Tenn.	W. N. Billingsley, A.M.	Christ.	1848	5	145	48	2,247	20,000	0
B	Butler College.	Irvington, Ind.	D. C. Brown (act.), A.M.	Christ.	1855	19	204	36	10,000	150,000	250,000
C	Butler University.	Indianapolis, Ind.	Scott Butler, A.M., LL.D.	None.	1855	11	134	52	1,200	13,000	25,000
B	Caldwell College.	Danville, Ky.	J. C. Ely, D.D.	Presb.	1860	11	134	52	1,200	13,000	25,000
B	California College.	Oakland, Cal.	T. G. Brownson, D.D.	Bapt.	1870	6	66	72	2,800	40,000	85,000
B	California University of	Berkeley, Cal.	Benjamin Ide Wheeler, A.M., Ph.D.	None.	1868	287	2,391	0	72,578	1,775,871	2,818,749
B	Cambridge University.	Holton, Kan.	E. N. Johnson, A.M., C.E.	None.	1882	18	440	41	600	40,000	0
A	Canisius College.	Buffalo, N. Y.	Rev. J. B. Thels, S.J.	R. C.	1870	25	227	40	90,865	288,685	0
A	Capital University.	Columbus, O.	F. W. Stellborn, D.D.	Lath.	1850	10	118	40	6,000	125,000	0
B	Carlton College.	Northfield, Minn.	Jas. W. Strong, D.D.	Cong.	1869	22	296	32	15,000	200,000	300,000
C	Carlton College.	Ronham, Tex.	Charles Carlton	Christ.	1867	11	89	54	435	8,000	0
B	Carson-Newman College.	Mossy Creek, Tenn.	J. T. Henderson, A.M.	Bapt.	1851	13	257	35	3,000	75,000	30,000
B	Carthage College.	Carthage, Ill.	J. M. Ruttrauff, D.D.	Lath.	1870	12	160	32	5,000	88,150	84,544
A	Case School of Applied Science.	Cleveland, O.	Cady Staley, Ph.D., LL.D.	None.	1880	20	240	100	2,000	500,000	2,000,000
B	Catawba College.	Newton, N. C.	J. C. Clapp, D.D.	Ref. Ger.	1851	10	116	40	1,500	12,000	15,000
A	Catholic University of America.	Washington, D. C.	Rt. Rev. T. J. Conaty, D.D., J.C.D.	R. C.	1863	80	175	75	46,584	825,000	806,000
B	Cedarville College.	Cedarville, O.	David McKinney, D.D.	Ref. Presb.	1869	8	48	27	900	14,000	85,000
A	Centenary College of Louisiana.	Jackson, La.	I. W. Cooper, D.D.	M. E. So.	1841	6	60	53	1,200	75,000	50,000
C	Central Baptist College.	Conway, Ark.	J. G. Lile, A.M.	Bapt.	1862	10	130	63	1,000	30,000	0
B	Central College.	Albany, Mo.	Zuinglius Moore, A.B.	Christ.	1862	9	70	55	210	80,000	7,000
B	Central College.	Fayette, Mo.	E. B. Crulthead, A.M., LL.D.	M. E. So.	1867	11	159	60	5,500	150,000	180,000
C	Central Female College.	Lexington, Mo.	Z. M. Williams, A.M.	M. E. So.	1869	20	100	50	2,000	50,000	0
C	Central High School.	Philadelphia, Pa.	R. E. Thompson, A.M., S.T.D.	None.	1857	44	1,235	43	3,224	1,011,383	0
C	Central Mississippi Institute.	French Camp, Miss.	A. E. Gobbie, D.D.	None.	1864	8	70	43	1,000	5,000	0
B	Central Pennsylvania College.	New Berlin, Pa.	John Braden, D.D.	U. Evang.	1855	7	108	53	4,933	22,000	24,000
B	Central Tennessee College.	Nashville, Tenn.	A. B. Chaffee, A.M., D.D.	M. E.	1866	25	297	19	4,250	105,000	10,000
B	Central University of Iowa.	Pella, Ia.	L. H. Blanton, D.D.	Bapt.	1853	9	103	38	4,000	40,000	25,000
A	Central Wesleyan College.	Richmond, Ky.	Geo. B. Addicks, A.M.	Presb.	1873	48	982	60	8,000	150,000	160,000
B	Centre College.	Warrenton, Mo.	Wm. C. Roberts, D.D., LL.D.	M. E.	1864	14	242	40	6,100	100,000	75,000
A	Chaddock College.	Danville, Ky.	Rev. A. M. Dauley	Presb.	1819	17	249	66	12,525	100,000	250,000
B	Chapel Hill Female College.	Quincy, Ill.	Rev. A. M. Dauley	M. E. So.	1853	14	82	47	1,000	70,000	0
C	Charles City College.	Charles City, Ia.	J. F. Smith	M. E. So.	1864	6	70	47	500	12,000	0
B	Charleston College.	Charleston, S. C.	L. F. Hirsch, M.A.	M. E.	1861	6	149	39	1,500	50,000	16,000
B	Chicago University of	Chicago, Ill.	Wm. E. Harper, LL.D.	None.	1793	6	86	40	13,500	75,000	285,300
C	Chilhowee Female College.	Pontiac, Miss.	S. Decatur Lucas	Presb.	1869	210	2,503	126	341,740	2,562,011	6,089,000
C	Chowan Bapt. Female Institute.	Murfreesboro, N. C.	John C. Scarborough	Bapt.	1864	6	68	48	4,000	7,500	0
A	Christian Brothers' College.	St. Louis, Mo.	Brother Paulian, F.S.C.	Presb.	1848	7	68	48	1,000	50,000	0
C	Christian Brothers' College.	Memphis, Tenn.	Rev. Bro. Maurelian, F.S.C.	B. C.	1861	24	405	50	30,000	600,000	0
C	Christian College.	Columbia, Mo.	Mrs. W. T. Moore	R. C.	1871	31	178	40	9,000	80,000	0
B	Christian University.	Canton, Mo.	Clinton Lockhart, A.M., Ph.D.	Christ.	1861	21	176	49	1,000	50,000	0
B	Cincinnati, University of	Cincinnati, O.	E. W. Hyde (dean)	Disciples.	1853	10	134	75	1,000	40,000	13,000
B	Cincinnati, University of	Cincinnati, O.	E. W. Hyde (dean)	Disciples.	1874	94	725	75	16,000	250,000	1,460,000

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B	Cladin University (colored).....	Orangeburg, S. C.	L. M. Duntun, D. D.	M. E.	1869	23	110	\$ 16	3,000	\$ 100,000	\$ 0
C	Claremont College.....	Hickory, S. C.	Stewart P. Hatton, A. M.	None	1889	14	155	42	8,000	30,000	0
B	Clark University.....	So. Atlanta, Ga.	C. M. Melden, Ph. D.	M. E.	1870	8	108	1	1,500	350,000	0
B	Clark University.....	Worcester, Mass.	G. Stanley Hall, LL. D.	None	1889	11	44	44	17,000	8,000	154,436
A	Clemson Agricultural College.....	Clemson College, S. C.	H. S. Haffcock, B. S.	None	1880	29	450	40	5,000	220,000	33,413
A	Clifford Seminary.....	Union, S. C.	R. G. Clifton, Ph. D., D. D.	Presb.	1881	7	50	45	6,000	100,000	462,600
B	Coe College.....	Cedar Rapids, Ia.	S. B. McCormick, D. D.	Presb.	1861	10	106	37	3,500	300,000	88,418
B	Colby College.....	Waterville, Me.	Nathaniel Butler, D. D.	Bapt.	1861	16	211	70	33,500	15,000	1,719,245
B	Colfax College.....	Colfax, Wash.	P. N. Englell, A. M., Ph. D.	Bapt.	1885	5	194	45	1,000	604,000	43,550
B	Columbia University.....	Hamilton, N. Y.	Geo. E. Merrill, D. D.	Bapt.	1846	85	333	65	95,901	100,000	0
A	College of City of New York.....	Emporia, Kan.	Alex. S. Webb, LL. D.	Bapt.	1846	60	1,678	0	81,536	100,000	0
A	College of Emporia.....	Emporia, Kan.	John C. Miller, D. D.	Presb.	1862	11	190	30	4,000	600,000	0
A	College of the Holy Cross.....	Worcester, Mass.	Rev. J. F. Lee, S. J.	B. C.	1863	25	341	70	10,000	80,000	0
A	College of the Immaculate Conception.....	New Orleans, La.	Rev. H. C. Saurin, S. J.	B. C.	1843	18	135	50	500	288,000	0
B	College of Montana.....	Butte, Mont.	A. B. Martin, A. M.	Presb.	1879	31	94	50	6,000	135,000	8,000
B	College of Notre Dame.....	San Jose, Cal.	Slater Mary Bernardine	B. C.	1881	87	186	35	4,000	350,000	7,000
A	College of the Sacred Heart.....	Denver, Col.	John F. Gildea, S. J.	B. C.	1876	15	138	45	4,000	300,000	338,923
A	College of the Sisters of Bethany.....	Topeka, Kan.	F. R. Millspaugh, D. D.	P. E.	1869	12	140	40	300	182,229	48,168
C	College for Young Ladies.....	Owrego, Kan.	W. F. Ransom, LL. D.	Presb.	1885	11	78	43	9,737	140,000	80,000
C	Colorado College.....	Colorado Springs, Col.	W. F. Ransom, LL. D.	None	1873	95	333	43	8,968	184,500	0
B	Colorado State Ag. College.....	Fort Collins, Col.	Agas Charman, A. M., B. S.	None	1874	12	261	10	15,000	75,000	0
B	Colorado State School of Mines.....	Golden, Col.	Robt. D. Smith, A. M., LL. D.	None	1877	66	610	10	7,506	800,000	0
B	Concordia College.....	Boulder, Col.	John A. Rice, M., D. D.	M. E. So.	1862	16	135	50	500	75,000	0
B	Columbia Athensum.....	Columbia, Tenn.	Sam. Gallatin, D. D.	None	1784	304	2,187	160	300,000	8,500,000	9,500,000
B	Columbia Female College.....	Columbia, S. C.	Beth L. Whilman, D. D.	Bapt.	1831	161	1,791	100	12,000	1,000,000	250,075
B	Columbia University.....	Washington, D. C.	B. L. Whilman, D. D.	Luth.	1889	7	175	40	3,760	100,000	0
B	Concordia College.....	Fort Wayne, Ind.	F. Schmidt, A. M.	None	1889	80	414	53	4,000	150,000	0
C	Cooper Memorial Institute.....	Spartanburg, S. C.	F. F. Wilson	Bapt.	1845	8	100	50	400	40,000	30,000
C	Cooper Memorial Institute.....	Gaffney City, S. C.	John R. Mack, M. A.	U. Presb.	1887	9	104	33	700	25,000	100,000
B	Cornell College.....	Sterling, Kan.	F. M. Spencer, D. D.	M. E.	1857	81	571	41	16,536	215,000	0
B	Cornell University.....	Mt. Vernon, Ia.	W. F. King, D. D., LL. D.	Christ.	1868	196	1,335	100	211,376	1,796,878	6,446,818
B	Cornell University.....	Ithaca, N. Y.	J. F. Schurman, LL. D.	None	1868	34	184	100	300	100,000	0
B	Cotter Female College.....	Bethany, Neb.	W. P. Ayasworth, LL. D.	M. E. So.	1864	14	140	45	700	80,000	0
C	Craigton University.....	Omaha, Neb.	Mrs. V. A. C. Stockard	R. C.	1870	47	951	30	500	100,000	0
B	Cumberland University.....	Lebanon, Tenn.	Rev. John Pabst, S. J.	Cumb. Presb.	1842	16	277	70	13,000	60,000	0
B	Dakota University.....	Lebanon, Tenn.	Nathan Green, LL. D.	M. E.	1845	18	908	30	3,000	60,000	0
C	Dalton Female College.....	Dalton, Ga.	W. T. Graham, D. D.	M. E. So.	1873	12	111	43	164	12,000	1,500,000
C	Dartmouth College.....	Hanover, N. H.	Miss Mabel Head, M. A., LL. D.	Cong.	1837	11	70	110	70,000	15,000	120,000
B	Dartmouth College.....	Hanover, N. H.	F. B. Stickney, D. D., LL. D.	Presb.	1839	11	96	36	11,000	30,000	0
B	Defiance College.....	Defiance, O.	J. B. E. Litchaw, A. M., D. D.	None	1864	15	47	40	150	30,000	0

Sex.	Name.	Location.	President.	Denomination.	Organized.	Officers of Instruction.	Students.	Collegiate Expenses.	Bound Volumes in Library.	Value of Buildings, Grounds and Library.	Amount of Productive Funds.
A	Delaware College.....	Newark, Del.	Geo. A. Harter, A.M., Ph.D.	None	1888	13	91	\$ 71	10,000	\$ 88,700	\$ 88,000
B	Delaware State Col. for Colored Students.....	Dover, Del.	W. C. Jason, A.M.	None	1892	7	47	0	500	18,800	0
B	Denison University.....	Granville, O.	D. B. Purinton, Ph.D., LL.D.	Bapt.	1831	23	379	48	20,000	160,000	480,000
B	Denver University of.....	University Park, Col.	Henry A. Buchtel, D.D.	M. E.	1864	89	414	80	8,500	650,000	175,085
B	DePauw University.....	Greencastle, Ind.	H. A. Goblin, D.D.	M. E.	1837	34	768	38	18,225	300,000	200,000
B	Des Moines College.....	Des Moines, Ia.	H. L. Stetson, D.D. (act.)	Bapt.	1865	12	138	39	2,442	145,000	159,880
B	Detroit College.....	Detroit, Mich.	Rev. James D. Foley, S. J.	R. C.	1877	13	256	40	8,820	160,000	305,000
B	Dickinson College.....	Carlisle, Pa.	Geo. E. Reed, S. T. D., LL.D.	M. E.	1788	27	410	96	45,000	303,300	68,923
B	Doane College.....	Cretia, Neb.	Rev. David B. Berry, A.M.	Cong.	1873	10	145	28	7,800	124,000	159,880
B	Drake University.....	Des Moines, Ia.	Wm. B. Craig, D.D.	Christ.	1881	34	710	40	4,500	145,000	405,000
B	Drew College.....	Madison, N. J.	H. A. Buttz, D. D., LL.D.	M. E.	1867	7	134	46	23,500	485,000	260,000
B	Due West Female College.....	Springfield, Mo.	Rev. H. T. Fuller, Ph.D.	Cong.	1873	17	299	38	9,400	150,000	102,000
B	Earlham College.....	Richmond, Ind.	C. E. Todd	None	1868	14	307	88	8,800	10,000	102,000
B	East Mississippi Female College.....	East Lake, Ala.	J. J. Mills, A. M., LL.D.	Friends.	1847	14	325	70	6	265,000	102,000
C	East Tennessee College.....	Meridian, Miss.	J. B. Cumming	None	1860	18	823	52	1,500	25,000	0
B	Elmira College.....	Elmira, N. Y.	J. W. Benson, A.M.	M. E.	1869	19	141	75	5,000	182,000	65,000
B	Elon College.....	Elon College, N. C.	A. C. MacKenzie, D.D.	Presb.	1855	9	86	55	1,250	60,000	0
A	Emory College.....	Oxford, Ga.	W. W. Stalls, D.D.	Christ.	1880	9	825	65	20,000	125,000	180,000
B	Emory and Henry College.....	Emory, Va.	C. E. Dowman, D.D.	M. E. So.	1837	16	825	65	20,000	110,000	10,000
B	Eureka College.....	Due West, S. C.	W. M. Grier, D.D.	M. E. So.	1838	8	119	59	10,000	65,000	86,000
B	Evangel College.....	Eureka, Ill.	J. H. Hardin, A. M., LL.D.	Presb.	1855	16	138	39	3,198	115,000	45,000
B	Fairfield College.....	Ewing, Ill.	J. A. Leavitt, D.D.	Bapt.	1867	13	130	35	4,000	50,000	0
B	Fairmount College.....	Fairfield, Neb.	C. W. Henry, A. M.	Christ.	1884	7	64	32	300	30,000	0
B	Fargo College.....	Fargo, N. D.	N. J. Morrison, D.D., LL.D.	Cong.	1882	15	157	32	10,000	75,000	0
B	Florida Conference College.....	Florida, O.	H. C. Simons, D.D.	Cong.	1888	10	114	35	2,500	57,000	34,000
B	Florida State Ag. College.....	Lakeland, Fla.	Chas. Manchester, D.D.	Ch. of God	1889	5	62	32	1,181	100,000	30,000
B	Fort Worth University.....	Fort Worth, Tex.	E. M. Franklin, D.D.	Cong.	1887	24	236	13	6,000	350,000	40,000
B	Franklin College.....	Franklin, Ind.	T. G. Lang, A. B.	M. E. So.	1866	21	172	48	28,800	610,000	0
B	Franklin College.....	New Athens, O.	W. F. Youn, A. M., D.D.	None	1882	36	864	48	3,000	160,000	207,000
B	Franklin College.....	Lancaster, Pa.	W. A. Williams, D.D.	Bapt.	1884	12	215	38	11,500	73,000	0
B	Franklin College.....	Fredericksburg, Va.	F. P. Ramsay	Ref. in U. S.	1832	34	306	45	32,603	800,000	400,000
B	Fredericksburg College.....	Fredericksburg, Va.	F. P. Ramsay	Ref. in U. S.	1832	10	164	55	200	15,000	0
B	Furman University.....	Greenville, S. C.	S. H. Lee	None	1863	9	67	48	2,800	50,000	0
B	Furman University.....	Greenville, S. C.	A. P. Montague, LL.D.	Bapt.	1854	15	168	63	5,000	100,000	68,000
B	Gale College.....	Galesville, Wis.	Wm. D. Thomas, D.D.	Presb.	1866	10	38	33	3,000	30,000	1,000
B	Gallaudet College for the Deaf.....	Washington, D. C.	E. M. Gallaudet, A. M., Ph.D.	None	1863	10	93	38	2,500	700,000	0
B	Gaston College.....	Dallas, N. C.	S. A. Wolf, A. M.	Luth.	1879	6	58	37	35	10,000	0
B	Gates College.....	Neligh, Neb.	Rev. Oscar F. Davis	Cong.	1881	10	139	87	5,500	35,400	35,000
B	General Theological Seminary.....	Manhattanboro, N. Y. C.	E. A. Hoffman, D.D., D. C. L.	P. E.	1817	12	164	0	28,844	1,388,000	1,908,138
B	Geneva College.....	Beaver Falls, Pa.	Wm. P. Johnston, D.D.	Ref. Presb.	1848	9	153	89	4,000	150,000	150,000

NAME.	LOCATION.	PRESIDENT.	Denomination.	Organized.	Officers of Instruction.	Students.	Collegiate Expenses.	Bound Volumes in Library.	Value of Grounds and Buildings.	Amount of Funds Produced.
Georgetown College.....	Georgetown, Ky.	A. Yeager, Ph.D. (act.)	Bapt.	1839	23	337	\$ 55	12,000	\$ 900,000	\$ 285,000
Georgetown University.....	Washington, D. C.	Rev. J. D. Whitney, S. J.	R. C.	1789	124	684	62	72,000	1,125,500	43,000
Georgia Female Seminary.....	Caldecville, Ga.	{ A. W. Van Hoose H. J. Pearce	None.	1878	18	318	50	80,000		0
Georgia Normal and Industrial College.....	Milledgeville, Ga.	Lyman Hall	None.	1891	15					0
Georgia School of Technology.....	Atlanta, Ga.	Wm. E. Higgs, D.D., LL.D.	None.	1868	18	327	45	120,000		0
Georgetown University of.....	Berlin, O.	C. Riemenschneider, Ph.D., DD.	None.	1891	40	470	15	28,960	505,000	888,000
German Wallace College.....	Philadelphia, Pa.	A. H. Peterson, Ph.D., LL.D.	M. E.	1864	10	133	18	2,040	97,900	72,877
Girard College.....	Glen Dale, O.	Ludlow D. Foster, D.D.	Presb.	1848	67	1,794	0	15,872	350,000	15,000,000
Glendale Female College.....	Washington, D. C.	John F. Galligan, S. J.	Presb.	1854	12	77	60	3,000	60,000	0
Glenn College.....	Spokane, Wash.	Rev. Jas. J. Reimann, S. J.	R. C.	1820	10	160	40	1,000	100,000	0
Glenn College.....	Edinburg, Mo.	Geo. W. Mitchell, D.D.	R. C.	1897	15	120	0	4,000		0
Grand River Christian Un. College.....	Greenboro, N. C.	R. N. Ringland	Presb.	1850	9	107	80	1,000	25,000	0
Grass Valley College.....	Grass Valley, Cal.	Dred Pounce, A. B.	M. E.	1827	5	34	50	300	50,000	0
Green College.....	Greenville, S. C.	M. S. Tynes	M. E.	1846	15	184	68	500	100,000	6,000
Green College for Women.....	Greenville, S. C.	M. M. R. Taylor	None.	1884	8	76	50	21,000		0
Greenville Female College.....	Greenville, S. C.	M. M. R. Taylor	None.	1854	14	905	55	800	21,000	0
Greenville and Tusculum Col.....	Tusculum, Tenn.	J. C. Ketter, D.D.	Bapt.	1854	8	146	48	7,500	25,700	0
Green College.....	Hopkinton, Ill.	Jer. Moore, D.D.	Presb.	1794	8					0
Grove City College.....	Grove City, Pa.	J. C. Ketter, D.D.	None.	1891	17	225	48	2,100	60,000	0
Guilford College.....	Guilford College, N. C.	L. L. Hobbs, A.M.	None.	1864	14	532	43	3,000	150,000	0
Guilford College.....	St. Peter, Minn.	M. W. Ableson, Ph.D.	Frien.	1837	10	143	52	4,000	100,000	0
Guilford College.....	St. Peter, Minn.	M. W. Ableson, Ph.D.	Luth.	1862	12	217	37	7,000	70,000	0
Guilford College.....	Water Valley, Miss.	Mrs. Eva B. Wilkinson	None.	1894	8	170	51	300	25,000	0
Guilford College.....	Clinton, N. Y.	M. W. Stryker, D.D.	None.	1812	19	164	75	37,000	500,000	400,000
Guilford College.....	Clinton, N. Y.	B. C. Hagerman, A.M.	Christ.	1869	19	160	50	2,000	100,000	0
Guilford College.....	St. Paul, Minn.	G. H. Bridgman, D.D.	M. E.	1854	63	395	36	6,000	100,000	108,110
Guilford College.....	Hampden-Sidney, Va.	R. McIlwaine, D.D.	None.	1775	7	198	77	15,000	100,000	140,000
Guilford College.....	Hampden-Sidney, Va.	H. B. Priest, D.D.	None.	1868	80	998	91	9,500	550,000	724,400
Guilford College.....	Hampden-Sidney, Va.	H. B. Priest, D.D.	None.	1868	80	998	91	12,000	125,000	175,000
Guilford College.....	Hanover, Ind.	D. W. Fisher, D.D.	Presb.	1827	13	138	31	1,500	90,000	58,700
Guilford College.....	Mexico, Mo.	J. W. Millon, A.M.	Bapt.	1873	14	214	43	72,000	900,000	800,000
Guilford College.....	Hartford, Conn.	C. D. Hartman, D.D.	Cong.	1834	18	73	970	150	4,000,000	10,320,860
Guilford College.....	Cambridge, Mass.	C. W. Eliot, LL.D.	None.	1863	404	859	150	40,800	400,000	19,000
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Presb.	1832	9	171	177	8,000		700,000
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,300		
Guilford College.....	Hanover, N.H.	S. G. Weston, A.M.	Frien.	1833	18	118	150	38,3		

Univ.	Name.	Location.	President.	Denomination.	Organized.	Officers of Instruction.	Students.	Collegiate Expenses.	Bound Volumes in Library.	Value of Grounds and Buildings.	Amount of Productive Funds.
B	Hawaii College	Hawaii College, Tenn.	S. G. Gilbreath, B. Sc., Ph. B.	None.	1849	13	85	\$ 45	8,000	\$ 10,000	\$ 364,967
A	Hobart College	Geneva, N. Y.	Rev. Robert E. Jones, S. T. D.	P. E.	1825	6	96	104	85,373	168,000	0
C	Hollins Institute	Hollins, Va.	C. L. Cocke, A. M.	Bapt.	1842	20	187	60	9,000	150,000	0
A	Holy Ghost College	Pittsburg, Pa.	John T. Murphy, C. S. Sp.	R. C.	1878	13	190	60	3,000	100,000	0
B	Hope College	Holland, Mich.	Gertrude K. Kelly, L. L. D.	Ref. in Am.	1868	14	187	18	14,000	100,000	203,330
B	Howard College	East Lake, Ala.	F. M. Roof, A. M.	Bapt.	1841	12	141	75	2,200	70,000	0
C	Howard Female College	Gallatin, Tenn.	A. C. Bligg	None.	1837	9	73	46	500	15,000	0
C	Howard Female College	Fayette, Mo.	Rev. H. D. Grove	M. E. So.	1864	12	143	55	1,200	50,000	5,900
B	Howard Payne College	Baywood, Tex.	J. H. Grove, A. M.	Bapt.	1860	10	137	90	2,000	45,000	0
B	Howard University	Washington, D. C.	J. E. Rankin, D. D.	None.	1867	75	614	0	13,200	600,000	180,000
B	Howard University	Huron, B. D.	Rev. C. H. French, M. A.	Presb.	1863	7	57	0	1,600	32,500	0
B	Idaho University of	Moscow, Idaho	Joseph P. Blanton	None.	1892	21	248	0	6,100	130,000	7,473
A	Illinois College	Jacksonville, Ill.	J. E. Bradley, L. L. D.	None.	1829	15	235	52	1,500	195,000	180,000
C	Illinois Female College	Jacksonville, Ill.	Dr. Jos. R. Harter	None.	1847	18	211	50	1,000	60,000	8,000
B	Illinois Wesleyan University	Champaign, Ill.	A. S. Draper, L. L. D.	None.	1867	183	1,352	23	94,388	1,000,000	464,084
B	Indian Wesleyan University	Bloomington, Ill.	Edgar M. Smith, D. D.	None.	1851	34	304	45	7,000	138,900	50,183
B	Indiana University	Bloomington, Ind.	J. H. Scott	Bapt.	1884	10	59	18	500	80,000	0
C	Indiana University	Columbus, Miss.	Joe. Swain, L. L. D.	None.	1890	60	1,049	18	29,450	200,000	600,000
B	Iowa College	Grimm, Ia.	A. A. Kincannon	None.	1865	21	319	0	1,200	125,000	0
B	Iowa Agricultural College	Anes, Ia.	Geo. A. Gates, D. D.	Cong.	1847	26	453	50	24,000	150,000	400,000
B	Iowa State University	Iowa City, Ia.	W. M. Beardshair, L. L. D.	None.	1868	59	636	0	11,458	470,000	681,034
B	Iowa Wesleyan University	Mt. Pleasant, Ia.	Geo. E. MacLean, L. L. D.	None.	1856	105	1,313	25	35,000	450,000	231,000
C	Irving College	Mechanicsburg, Pa.	C. L. Stafford, D. D.	M. E.	1844	18	364	41	8,000	150,000	55,000
C	Isabel College	Talladega, Ala.	E. E. Campbell, A. M., Ph. D.	Luth.	1856	13	130	50	1,000	40,000	0
C	Jacksonville Female Academy	Jacksonville, Ill.	E. F. Bullard, A. M.	Presb.	1849	7	94	50	100	15,000	0
C	Jefferson College	Convent, La.	M. Thouverin, S. M.	None.	1890	9	98	50	2,500	50,000	0
C	Jessamine Female Institute	Nicholasville, Ky.	Mrs. Vineyard	R. C.	1865	12	110	50	4,000	80,000	0
B	John B. Stetson University	De Land, Fla.	John F. Forbes, Ph. D.	None.	1864	14	137	50	300	20,000	0
B	Johns-Hopkins University	Baltimore, Md.	D. C. Gilman, L. L. D.	Bapt.	1863	25	191	60	7,000	275,000	200,000
C	Judson Institute	Marton, Ala.	Robert G. Patrick, D. D.	None.	1876	123	641	155	84,000	747,626	8,250,000
B	Kalamazoo College	Kalamazoo, Mich.	A. G. Slocum, L. L. D.	Bapt.	1835	10	128	53	1,500	70,000	0
B	Kansas State Ag. College	Manhattan, Kan.	F. H. Snow, Ph. D., L. L. D.	Bapt.	1855	14	180	30	6,338	60,000	197,108
B	Kansas University of	Lawrence, Kan.	G. J. Hagerty, A. M.	None.	1863	32	803	0	1,940	254,325	503,479
B	Kansas Wesleyan University	Salina, Kan.	F. W. Tompkins	M. E.	1866	58	1,063	0	28,707	450,000	135,000
B	Keachle College	Keachle, La.	Rev. C. L. Keedy, A. M., M. D.	Bapt.	1896	7	98	33	8,000	50,000	0
B	Kee Mar College	Hagerstown, Md.	Rev. C. L. Keedy, A. M., M. D.	Luth.	1896	15	110	40	1,200	50,000	3,500
B	Kentucky Wesleyan Col.	Lexington, Ky.	Reub. L. Cave, D. D.	Luth.	1860	6	60	50	2,500	50,000	0
B	Kentucky Wesleyan Col.	Winchester, Ky.	Eug. H. Pearce, D. D.	Christ.	1896	13	262	22	15,000	250,000	203,479
B	Kenyon College	Gambler, O.	W. F. Peirce, L. H. D.	M. E. So.	1860	17	448	58	2,000	75,000	35,448
A	Keuka College	Keuka Park, N. Y.	Geo. H. Ball, A. M., D. D.	P. E.	1825	21	154	88	32,000	307,356	270,500
B	King College	Bristol, Tenn.	J. A. Wallace, D. D.	Free Bapt.	1892	10	100	50	1,700	150,000	100,000
B	Knox College	Galesburg, Ill.	J. H. Finley, Ph. D.	Presb.	1867	5	80	60	5,000	25,000	30,000
B	Knox College	Galesburg, Ill.	J. H. Finley, Ph. D.	None.	1887	23	538	50	10,000	200,333	171,807

Sex.	Name.	Location.	President.	Denomination.	Organized.	Officers of Instruction.	Students.	Collegiate Expenses.	Bound Volumes in Library.	Value of Grounds and Buildings.	Amount of Productive Funds.
B	Knoxville College.	Knoxville, Tenn.	R. W. McGrath, D. D.	U. Presb.	1875	20	409	\$ 5	2,000	\$ 100,000	\$ 0
B	La Fayette College.	La Fayette, Ala.	Geo. R. McNeill, A. M., Ph. D.	None.	1883	8	235	100	300	15,000	380,400
B	Lafayette Seminary.	Easton, Pa.	E. D. Warfield, LL. D.	Presb.	1832	28	315	115	19,100	650,000	0
B	Lafayette College.	Lafayette, Ore.	C. C. Poling, Ph. D.	U. Evang.	1839	9	53	30	300	8,000	0
C	La Grange Female College.	La Grange, Mo.	Jesse F. Muir, LL. D.	Bapt.	1838	15	102	40	6,000	90,000	12,000
C	Lake Erie College and Seminary.	La Grange, Ga.	Reuben W. Smith, A. M.	M. E. So.	1838	20	219	55	2,000	60,000	10,000
B	Lake Forest University.	Palmer, O.	Mary Evans, A. M.	Presb.	1853	21	110	40	4,500	315,000	27,000
B	Lake Forest Seminary.	Lake Forest, Ill.	J. G. K. McClure, D. D.	Presb.	1876	128	1,400	40	18,000	600,000	501,000
B	Lane Theological Seminary.	Cincinnati, O.	David S. Schaff (Chair. of Faculty)	Presb.	1852	5	26	175	500	500,000	275,000
B	Lane University.	Lecompton, Kan.	C. M. Brooke, A. M.	U. B.	1863	9	175	50	8,000	150,000	0
B	La Salle College.	Philadelphia, Pa.	Rev. Bro. Jeddore, F. S. C.	R. C.	1863	14	303	80	2,354	140,000	0
B	Lawrence University.	Annapolis, Md.	C. C. Bragdon, A. M.	None.	1831	81	134	100	15,873	225,000	215,000
B	Lebanon Valley College.	Appleton, Wis.	Sam. Plautz, D. D.	M. E.	1847	22	234	13	6,000	85,000	60,000
B	Lebanon Valley College.	Annville, Pa.	Rev. H. V. Roop, Ph. D.	U. B.	1866	16	160	41	97,000	1,800,000	2,000,000
A	Lehigh University.	S. Bethlehem, Pa.	Thos. M. Drown, LL. D.	None.	1866	43	368	100	38,000	2,000,000	8,500,000
B	Leland Stanford, Jr., University.	Stanford University, Cal.	D. S. Jordan, LL. D.	None.	1891	85	1,234	0	1,000	175,000	94,000
B	Leland University.	New Orleans, La.	E. C. Mitchell, D. D.	Bapt.	1870	7	60	0	2,700	32,000	0
B	Lenoir College.	Hickory, N. C.	Rev. R. A. Yoder, A. M.	Luth.	1891	5	145	37	300	25,000	8,000
B	Liberty College.	Hopkinton, Ia.	Andrew G. Wilson.	Presb.	1858	10	118	38	2,700	32,000	0
B	Liberty College for Young Ladies.	Glasgow, Ky.	H. I. Greenwell.	Bapt.	1875	6	84	36	150	35,000	0
B	Lima College.	Liberty, Mo.	C. M. Williams.	None.	1890	15	142	30	1,070	60,000	0
B	Linden Hall Seminary.	Lima, O.	Rev. S. P. Long, A. M.	Ev. Luth.	1890	10	106	42	500	80,000	0
B	Lindenwood Female College.	Lincoln, Ill.	A. E. Turner, A. M.	Cumb. Presb.	1863	14	118	25	2,500	80,000	60,000
C	Livingstone College.	Lincoln University, Pa.	I. N. Rendall, D. D.	Presb.	1854	10	213	45	15,800	200,000	487,000
C	Livingstone College.	St. Charles, Mo.	Rev. J. A. L. Mench.	Moravian	1794	13	84	55	2,600	30,000	0
C	Livingstone College.	Salisbury, N. C.	M. H. Ream.	Presb.	1890	8	45	28	3,000	75,000	0
C	Louisiana State University.	Louisville, Ala.	Henry J. Williamson, A. B.	None.	1890	6	213	38	4,000	120,000	2,500
C	Louisiana State University.	Russellville, Ky.	Wm. H. Goler, D. D.	M. E. So.	1898	8	158	0	2,000	35,000	0
C	Louisiana State University.	Galesburg, Ill.	Chas. E. Nash, D. D.	Univers.	1866	11	104	03	7,000	95,000	150,000
C	Louisiana State University.	Louisburg, N. C.	Al. S. Davis, A. M.	M. E.	1867	10	134	55	1,000	6,000	0
C	Louisiana State University.	Baton Rouge, La.	Thos. D. Boyd, M. E.	None.	1860	20	320	0	20,000	300,000	318,313
C	Louisiana State University.	Baltimore, Md.	Rev. J. A. Morgan, S. J.	R. C.	1863	14	100	60	40,000	300,000	0
C	Louisiana State University.	Athens, Ga.	Mary A. Lipscomb.	None.	1868	16	168	60	4,000	50,000	0
C	Louisiana State University.	Decorah, Ia.	Rev. Luth. Larsen.	Evangel. Luth.	1861	14	138	21	9,098	80,000	8,297
C	Louisiana State University.	St. Paul, Minn.	Jas. Wallace, Ph. D.	Presb.	1860	13	130	45	6,500	150,000	8,000
C	Louisiana State University.	Macomb, Miss.	C. H. Otken, LL. D.	None.	1894	6	74	50	800	5,000	0
C	Louisiana State University.	McKendree College.	McK. H. Chamberlin, LL. D.	M. E.	1898	10	159	38	8,000	60,000	22,500
C	Louisiana State University.	McKendree College.	H. Boardman, A. M.	Bapt.	1850	10	108	33	2,500	40,000	40,000
C	Louisiana State University.	Oreono, Mo.	Rev. A. F. Gales, Ph. D.	None.	1866	24	324	80	14,000	191,566	219,819
C	Louisiana State University.	Kent's Hill, Me.	Rev. A. F. Gales, Ph. D.	R. C.	1864	9	326	80	7,899	130,000	110,000
C	Louisiana State University.	Manhattan College.	Rev. Bro. Justin, LL. D.	R. C.	1868	24	671	100	9,367	612,066	0

(a) \$3.50 per study per term.

SEX.	NAME.	LOCATION.	PRESIDENT.	Denomination.	Organized.	Officers of Instruction.	Students.	Collegiate Expenses.	Bound Volumes in Library.	Value of Grounds and Buildings.	Amount of Productive Funds.
C	Mansfield Female College	Mansfield, Ia.	T. S. Sligh, A. M.	M. E.	1855	7	70	191	500	\$25,000	\$ 0
B	Marietta College	Marietta, O.	J. H. Chamberlin, Lt. D. (dean).	None.	1885	22	362	82	55	130,000	0
C	Marion Female College	Marion, Va.	J. J. Scherer, A. M.	Luth.	1878	9	87	85	310	30,000	0
C	Marion Female Seminary	Marion, Ala.	James D. Wade, A. M.	None.	1886	11	100	60	500	20,000	0
A	Marquette College	Marquette, Wis.	Rev. W. B. Rogers	R. C.	1881	11	231	60	930	7,000	0
B	Mars Hill College	Mars Hill, N. C.	R. L. Moore, A. M.	Bapt.	1855	6	900	90	500	130,000	0
C	Martin Washington College	Arlington, Va.	Rev. W. M. Dyer, A. M.	M. E. So.	1860	10	175	50	1,000	50,000	0
C	Martin Female College	Pulaski, Tenn.	Leonard L. Vann, A. M.	M. E.	1870	20	150	2,000	2,000	85,000	80,000
C	Maryland College	College Park, Md.	R. W. Silverster	M. E.	1859	17	105	1,100	2,100	74,000	0
C	Maryland Ag. College	Maryville, Md.	J. H. Turner, A. M.	Luth.	1853	13	100	60	1,500	40,000	0
B	Maryville College	Maryville, Tenn.	S. W. Boardman, D. D.	Presb.	1819	16	879	12	12,000	100,000	255,000
B	Massachusetts Ag. College	Amherst, Mass.	H. H. Goodell, Lt. D.	None.	1867	19	173	60	18,000	323,775	380,575
B	Massachusetts Inst. of Technology	Boston, Mass.	Jas. M. Crafts, Lt. D.	None.	1825	133	1,201	200	40,015	950,000	650,000
A	Memphis Conf. Fem. Inst.	Jackson, Tenn.	P. D. Pollock, A. M., Lt. D.	M. E. So.	1845	16	172	60	5,232	45,000	0
C	Mercer University	Carle Place, Ga.	Rev. David Stanton Tappan	Bapt.	1887	15	290	15	15,000	150,000	298,618
A	Metzger College	Carle Place, Ga.	Wm. A. West, D. D.	None.	1881	8	66	15	75,000	60,000	40,000
B	Miami University	Oxford, O.	M. E. Wadsworth, Ph. D.	None.	1884	15	137	100	15,000	130,000	60,000
B	Michigan College of Mines	Houghton, Mich.	J. L. Snyder, Ph. D.	None.	1885	17	122	625	13,800	130,971	0
B	Michigan Ag. College	Agricultural College, Mich.	J. B. Angell, Lt. D.	None.	1885	43	469	0	21,000	855,283	625,000
B	Michigan, University of	Ann Arbor, Mich.	Ezra Kintz, D. D.	None.	1837	184	3,115	40	120,000	1,300,000	545,964
B	Middlebury College	Middlebury, Vt.	Jac. A. Knitz, D. D.	None.	1800	11	108	72	23,000	100,000	380,000
B	Midland College	Atchison, Kan.	Rev. C. C. Fisher, A. M.	Luth.	1857	12	112	4,000	4,000	46,500	24,055
B	Millersburg Female College	Atchison, Kan.	J. Hopwood, A. M.	Christ.	1851	15	100	60	800	10,000	0
B	Mills College and Seminary	Millersburg, Ky.	Mrs. C. T. Mills	None.	1853	7	187	36	1,500	15,000	75,000
C	Mills College	Milligan, Tenn.	Wm. B. Murnah, D. D., Lt. D.	None.	1871	26	142	185	6,000	250,000	109,000
C	Millsaps College	Seminary Park, Col.	W. C. Whitford, D. D.	M. E.	1862	63	200	80	4,000	70,000	83,743
B	Milton College	Milton, Wis.	Ellen C. Sabina, A. M.	7th-D. Bapt.	1844	10	100	36	4,000	32,000	150,000
B	Minneapolis, Minn.	Minneapolis, Minn.	Cyrus Northrop, Lt. D.	Cong. and Presb.	1885	17	170	120	4,121	40,000	150,000
A	Mississippi Ag. and Mech. Col.	Franklin, Wis.	H. A. Muchmiller, D. D.	None.	1868	14	2,892	15	52,000	1,672,000	1,346,889
A	Mississippi College	Clinton, Miss.	Gen. Stephen D. Lee, Lt. D.	Ref.	1859	16	104	80	6,000	40,000	24,000
A	Mississippi University of	Columbia, Miss.	Wm. T. Lowrey, D. D.	None.	1853	21	296	0	6,457	175,290	98,575
B	Missouri, Univ. of	Columbia, Mo.	Robt. B. Fulton	Bapt.	1863	10	115	85	8,000	50,000	43,500
B	Missouri Valley College	Marshall, Mo.	R. H. Jesse, Lt. D.	None.	1842	64	274	20	15,500	230,000	540,000
B	Missouri Wesleyan College	Canon, Mo.	Rev. B. W. Baker, A. M.	C. M. E.	1838	9	194	46	3,300	132,000	1,239,889
B	Monmouth College	Monmouth, Ill.	S. R. Lyons, D. D.	U. Presb.	1856	14	258	35	20,000	85,000	180,000
B	Monroe Female College	Forsyth, Ga.	A. A. Marshall,	M. E.	1849	14	175	31	1,000	35,000	0
B	Montana Agricultural College	Bozeman, Mont.	James Reid	Bapt.	1868	19	201	5	2,360	190,000	0
B	Montana, University of	Missoula, Mont.	Oscar J. Craig, A. M., Ph. D.	None.	1883	13	170	6	2,960	105,000	0
B	Montana Wesleyan University	Helena, Mont.	J. C. Templeton	None.	1893	12	47	30	1,000	90,000	0
B	Moore's Hill College	Moore's Hill, Ind.	J. C. Lewis, M. S.	M. E.	1860	9	126	57	3,000	2,000	0
A	Moravian College	Bethlehem, Pa.	Aug. Schultz, D. D.	Morav.	1807	5	47	50	6,500	100,000	115,000

a \$80 to non-residents. b \$150 to non-residents.

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C	Moravian Col. and Sem. for Women.	Bethlehem, Pa.	J. Max Hork, D. D.	Morav.	1749	23	98	\$60	6,000	\$100,000	\$ 0
B	Morgan College.	Baltimore, Md.	F. J. Wagner, D. D.	M. E.	1876	8	36	9	8,000	50,000	25 0
B	Morningside College.	Sioux City, Ia.	W. S. Lewis, D. D.	M. E.	1866	13	215	36	800	40,000	0
B	Morris Brown Col. (colored).	Atlanta, Ga.	Jas. M. Henderson, A. M., D. D.	M. E.	1865	8	105	9	1,500	80,000	0
B	Morrisville College.	Morrisville, Mo.	J. J. Pritchett, L. L. D.	M. E.	1873	11	135	55	5,000	15,000	0
A	Mt. Angel College.	Mt. Angel, Ore.	F. Dominic, O. S. B.	R. C.	1867	17	135	50	6,000	15,000	0
B	Mountain Home Bapt. College.	Mountain Home, Ark.	J. F. Howell	Bapt.	1868	4	45	100	850	13,000	0
C	Mt. Holyoke College.	So. Hadley, Mass.	Mrs. E. S. Mead, A. M.	None.	1863	41	393	75	17,508	450,000	380,000
A	Mt. St. Mary's College.	Emmitsburg, Md.	Very Rev. W. L. O'Hara, M. A.	R. C.	1868	97	199	30,000	30,000	175,000	0
B	Mt. Union College.	Allentown, O.	A. B. Ryker, D. D.	M. E.	1846	91	405	23	3,500	100,000	75,000
A	Muhlenberg College.	Allentown, Pa.	Thos. L. Selp, D. D.	Luth.	1867	13	160	55	10,000	100,000	154,000
B	Munkingum College.	New Concord, O.	Jesse Johnson, D. D.	U. Presb.	1867	15	156	35	2,500	30,000	87,000
B	Nannie Lou Warthen College.	Wrightsville, Ga.	Thos. C. Price, D. D.	M. E. So.	1868	6	98	30	250	8,000	0
C	Nashville Col. for Y. L.	Nashville, Tenn.	G. W. F. Price, D. D.	M. E. So.	1860	94	118	70	1,350	140,000	0
B	Nebraska Wesleyan Univ.	Lincoln, Neb.	Prof. Charles E. Bessey (act.).	None.	1871	115	1,411	5	40,000	735,000	160,000
B	Nebraska State University.	University Place, Neb.	D. C. W. Huntington, D. D.	M. E.	1868	17	364	10	3,000	150,000	0
A	Nevada Technical School.	Reno, Nev.	Jos. E. Stubbs, D. D.	None.	1866	19	337	0	6,457	156,184	95,000
A	Newark College.	Newark, N. J.	C. A. Colton, E. M.	None.	1865	9	230	700	700	70,000	0
A	Newberry College.	Newberry, S. C.	Geo. B. Cromer	Luth.	1859	8	161	40	7,000	45,000	33,800
C	New Hampshire Conf. Sem. and Fem. Col.	Tilton, N. H.	Geo. L. Plimpton, M. A.	M. E.	1845	13	150	60	3,000	80,000	40,000
B	New Mexico Col. of Ag. and Mech. Arts.	Albuquerque, N. Mex.	C. T. Jordan	None.	1891	17	215	5	3,316	61,000	0
B	New Orleans University.	New Orleans, La.	L. G. Addicks, D. D.	M. E.	1873	15	68	5-10	4,000	50,000	0
A	Newton Theological Inst.	Newton Centre, Mass.	Nathan E. Wood, D. D.	Bapt.	1835	8	68	.....	5,000	100,000	.....
B	New Windsor College.	New Windsor, Md.	Rev. Jas. M. Nourse	Presb.	1843	5	40	.....	25,000	225,000	500,000
A	* New York University.	University Heights, N. Y. C.	H. M. McCracken, D. D., LL. D.	None.	1831	116	1,353	45	500	13,000	0
A	Niagara University.	Niagara Falls, N. Y.	Rev. P. McHale, C. M.	R. C.	1861	57	311	180	44,590	1,795,941	1,356,767
C	Norfolk College for Young Ladies.	Norfolk, Va.	Geo. F. Wingate, LL. B.	None.	1866	18	184	60	285	150,000	0
A	North Carolina College.	Mt. Pleasant, N. C.	M. G. G. Scherer, A. M.	Ev. Luth.	1878	18	44	44	8,000	15,000	0
A	* North Carolina Univ. of	Chapel Hill, N. C.	E. A. Alderman, D. C. L.	None.	1859	4	76	83	30,000	300,000	15,000
B	North Dakota College.	Fargo, N. D.	J. H. Worst	None.	1796	33	508	83	30,000	300,000	100,000
B	North Dakota Univ. of	University, N. D.	W. Morrill, M. A.	None.	1860	17	290	0	4,073	130,000	0
B	Northern Illinois College.	Fulton, Ill.	J. E. Bittlinger, A. M.	None.	1864	13	360	5	6,000	130,000	0
B	Northwestern College.	Naperville, Ill.	Rev. H. J. Kukhoefer, A. M.	Evangel.	1861	19	263	80	1,800	60,000	0
B	Northwest Missouri College.	Albany, Mo.	W. H. Pritchett, A. M.	M. E. So.	1862	8	96	30	5,000	85,000	105,000
B	Northwestern University.	Evanston, Ill.	H. W. Rogers, LL. D.	M. E.	1858	351	2,690	50	87,896	32,000	8,850,000
B	Northwestern University.	Watertown, Wis.	A. F. Ernst	Luth.	1853	12	136	84	3,570	64,000	0
C	Notre Dame of Maryland.	Northfield, Md.	Allen D. Brown, U. S. N.	R. C.	1873	11	175	17	6,000	25,000	0
B	Oberlin College.	Oberlin, O.	J. H. Burrows, D. D.	None.	1833	69	907	13	12,400	1,067,700	993,468
B	Oberlin College.	Los Angeles, Cal.	Guy W. Wadsworth, A. B.	Presb.	1867	10	13	60	40,000	40,000	0
A	Ogden College.	Bowling Green, Ky.	W. F. Edmunds	None.	1867	5	73	50	3,310	40,000	130,000
C	Ogontz School.	Ogontz, Pa.	Sylvia J. Knapp	None.	1860	23	128	200	12,000	40,000	0

* Co-educational in law, pedagogy, and graduate school. † Co-educational in graduate courses only.

Sex	Name.	Location.	President.	Denomination.	Organized.	Officers of Instruction.	Students.	Collegiate Expenses.	Bound Volumes in Library.	Value of Grounds and Buildings.	Amount of Productive Funds.
B	Ohio State University.....	Columbus, O.	William O. Thompson, D.D.	None.	1870	85	1,150	\$15	28,839	\$2,000,000	\$350,469
B	Ohio University.....	Athens, O.	Ch. W. Super, LL.D.	None.	1804	92	418	9	14,500	250,000	150,000
B	Ohio Wesleyan University.....	Delaware, O.	J. H. Bashford, D.D.	M. E.	1844	97	1,308	84	25,000	494,000	688,086
B	Oklahoma Ag. and Mech. Col.	Stillwater, Okla. Ter.	G. E. Morrow, M. A.	M. E.	1891	11	169	0	4,900	32,000	0
B	Oklahoma, University of.....	Norman, Okla. Ter.	D. R. Boyd, A. M.	None.	1892	10	367	6	2,300	60,000	76,281
B	Olivet College.....	Olivet, Mich.	W. G. Sperry, D.D.	Cong.	1844	94	219	45	28,000	158,757	76,281
B	Oregon State Ag. Col.	Corvallis, Ore.	Thomas M. Gatch, Ph.D.	None.	1870	37	886	10	5,700	153,000	187,808
B	Oregon, University of.....	Eugene, Ore.	Dr. F. S. Strong	None.	1878	98	837	10	7,000	200,000	150,000
B	Ottawa University.....	Ottawa, Kan.	J. D. S. Riggs, Ph.D.	Bapt.	1865	18	501	80	8,500	180,000	0
B	Otterbein University.....	Westerville, O.	T. J. Sanders, Ph.D.	U. B.	1847	15	201	86	8,000	65,000	73,000
B	Onachita College.....	Arkadelphia, Ark.	J. W. Conger, A. M.	Bapt.	1866	11	820	58	2,500	75,000	0
B	Owensboro Female College.....	Owensboro, Ky.	A. C. Goodwin, Ph.D.	None.	1860	8	100	50	700	30,000	0
C	Oxford College.....	Oxford, O. C.	Faye Walker, D.D.	Presb.	1849	27	123	55	5,000	50,000	0
C	Oxford Female Sem.....	Newberg, Ore.	F. P. Hobgood	Bapt.	1850	9	122	50	1,000	15,000	7,000
B	Pacific Methodist College.....	Santa Rosa, Cal.	Thos. Newlin, A. M.	M. E.	1891	8	111	40	1,000	15,000	0
B	Pacific University.....	Forest Grove, Ore.	J. S. Austin, A. M.	Cong.	1863	11	162	48	9,000	105,000	100,000
B	Packer Collegiate Inst.....	Brooklyn Boro, N. Y. C.	Thos. McClelland, D.D.	None.	1848	11	708	155	7,407	220,647	40,000
B	Park College.....	Parkville, Mo.	T. J. Backus, LL.D.	None.	1854	13	338	56	12,000	424,000	425,000
B	Parker College.....	Winnebago City, Minn.	J. M. McAfee	Free Bapt.	1875	20	410	30	500	35,000	60,000
B	Parkersburg Female Seminary.....	Parkersburg, W. Va.	R. M. Lawrence, A. M.	None.	1867	6	66	30	350	6,500	0
B	Parsons College.....	Fairfield, Ia.	Mrs. H. L. Field	Presb.	1872	4	42	41	5,000	125,000	58,000
B	Paul Quinn College.....	Waco, Tex.	Rev. H. E. Jenkins, Ph.D.	None.	1875	12	141	23	380	75,000	0
B	Penn College.....	Oskaloosa, Ia.	J. M. Burge, D.D.	A. M. E.	1891	7	188	28	23	40,000	25,000
B	Pennsylvania College for Women.....	Pittsburg, Pa.	A. Rosenberger, LL.D.	Friends.	1873	13	233	38	4,700	40,000	0
B	Pennsylvania College.....	Gettysburg, Pa.	R. Jennie DeVere	Presb.	1870	23	194	100	3,500	350,000	0
A	Pennsylvania Military College.....	Chester, Pa.	H. W. McKnight, D.D.	Lath.	1892	16	268	56	24,000	349,000	310,000
B	Pennsylvania State College.....	State College, Pa.	Chas. E. Hyatt, C. E.	None.	1893	14	111	11	1,200	150,000	517,000
B	Pennsylvania, University of.....	Philadelphia, Pa.	G. W. Atherton, LL.D.	None.	1859	47	347	0	13,408	780,000	2,179,065
B	Philander Smith College.....	Little Rock, Ark.	C. C. Harrison, LL.D.	None.	1740	298	4	200	150,000	3,693,019	0
B	Philomath College.....	Philomath, Ore.	Rev. Jas. M. Cox, A. M.	M. E.	1881	9	95	2,838	800	30,000	5,000
B	Pike College.....	Bowling Green, Mo.	P. O. Bonebrake, A. M.	None.	1866	9	116	26	600	14,000	0
B	Polytechnic College.....	Fort Worth, Tex.	W. F. Lloyd, D.D.	None.	1891	7	155	64	2,500	25,000	0
A	Polytechnic Institute.....	Brooklyn Boro, N. Y. C.	Henry S. Snow, LL.M.	M. E. So.	1891	49	632	200	7,363	825,000	108,000
B	Pomona College.....	Claremont, Cal.	F. L. Ferguson	Cong.	1888	15	206	63	8,000	60,000	100,000
B	Port Gibson Female College.....	Port Gibson, Miss.	Jos. B. Allen	None.	1843	12	60	40	200	15,000	0
B	Portland University.....	Portland, Ore.	Geo. Whitaker, D.D.	M. E.	1890	25	340	64	3,000	175,000	0
B	Prairie College.....	Bowling Green, Ky.	Benjamin F. Cabell	None.	1880	18	192	64	5,000	90,000	0
B	Pratt Institute.....	Brooklyn Boro, N. Y. C.	Charles M. Pratt	None.	1897	185	2,574	40	67,906	1,069,946	2,100,000
B	Presbyterian College for Women.....	Columbia, S. C.	Bar. Robt. P. Peil	Presb.	1890	18	192	60	1,300	40,000	0
B	Presb. Col. of S. C.....	Clinton, S. C.	A. E. Spencer, M. A.	Presb.	1880	6	55	45	1,300	15,000	6,500
A	Princeton Theol. Sem.....	Princeton, N. J.	W. H. Green, D.D., LL.D. (act.)	Presb.	1812	12	200	....	62,700	21,575,465	....

a Including endowment.

NAME.	LOCATION.	PRESIDENT.	Denomination.	Organized.	Officers of Instruction.	Students.	Collegiate Expenses.	Bound Volumes in Library.	Value of Grounds and Buildings.	Amount of Productive Funds.
A Princeton University.....	Princeton, N. J.....	F. L. Patton, D. D., LL. D.....	None.....	1746.....	84.....	1,065.....	\$58.....	134,000.....	\$45,000.....	\$80,000.....
B Pritchett College.....	Gloucester, Mo.....	Rev. C. C. Hemmaway, Ph. D.....	None.....	1896.....	11.....	106.....	46.....	500.....	500.....	0.....
A Proseman College.....	Elmhurst, Ill.....	Rev. D. Whitfield, D. D.....	Evangelical.....	1871.....	8.....	112.....	50.....	1,982.....	65,000.....	0.....
B Puget Sound Univ.....	Tacoma, Wash.....	William Whitfield, D. D.....	M. E.....	1870.....	13.....	125.....	.....	1,800.....	50,000.....	.....
B Purdue University.....	Lafayette, Ind.....	J. H. Stuart, LL. D.....	None.....	1874.....	66.....	751.....	.....	9,000.....	250,000.....	.....
A Racine College.....	Racine, Wis.....	Arthur Piper, S. T. D.....	P. E.....	1853.....	7.....	50.....	.....	10,000.....	250,000.....	.....
C Radcliffe College.....	Cambridge, Mass.....	Mrs. Elizabeth C. Agassiz.....	None.....	1879.....	97.....	424.....	900.....	12,475.....	300,000.....	875,000.....
A Randolph-Macon College.....	Ashland, Va.....	John A. Kerr, D. D.....	M. E. So.....	1852.....	10.....	110.....	96.....	10,000.....	110,000.....	125,000.....
A Randolph-Macon Woman's Col.....	Lynchburg, Va.....	Wm. V. Smith, A. M., LL. D.....	M. E. So.....	1863.....	25.....	233.....	30.....	1,200.....	148,627.....	102,667.....
B Red River Valley Univ.....	Wahpeton, N. D.....	M. V. B. Knox, D. D.....	M. E.....	1892.....	8.....	135.....	36.....	2,000.....	45,000.....	0.....
C Rensselaer Polytechnic Inst.....	Troy, N. Y.....	J. H. Rick, LL. D.....	None.....	1834.....	15.....	138.....	260.....	6,500.....	125,000.....	141,785.....
B Rhode Island Col. of Ag. and Mech. Arts.....	Kingston, R. I.....	J. H. Washburn.....	None.....	1890.....	25.....	151.....	0.....	6,750.....	170,350.....	50,000.....
B Richmond College.....	Richmond, O.....	G. W. MacMillan, D. D.....	None.....	1885.....	8.....	54.....	40.....	3,000.....	40,000.....	0.....
B Richmond College.....	Richmond, Va.....	F. W. Boatwright, M. A.....	Bapt.....	1852.....	17.....	262.....	89.....	13,925.....	400,000.....	270,000.....
C Richmond Woman's College.....	Richmond, Va.....	James Nelson.....	Bapt.....	1854.....	24.....	228.....	.....	1,000.....	60,000.....	0.....
B Rio Grande College.....	Rio Grande, O.....	Rev. Geo. Hindley.....	Cong.....	1892.....	6.....	88.....	27.....	3,000.....	20,000.....	0.....
B Ripon College.....	Ripon, Wis.....	J. M. Davis, Ph. D., D. D.....	Free Bapt.....	1876.....	17.....	139.....	56.....	1,000.....	30,000.....	60,000.....
A Rounoke College.....	Salem, Va.....	R. C. Flagg, D. D.....	None.....	1851.....	17.....	139.....	36.....	8,000.....	100,000.....	210,000.....
C Rounoke Female College.....	Rockford, Ill.....	J. D. Dreher, Ph. D.....	None.....	1853.....	12.....	191.....	62.....	21,000.....	100,000.....	40,000.....
A Rock Hill College.....	Danville, Va.....	C. F. James, D. D.....	Bapt.....	1859.....	7.....	78.....	50.....	1,000.....	25,000.....	0.....
B Roger-Williams Univ.....	Providence, R. I.....	Phebe F. Sutliff, A. M.....	None.....	1859.....	17.....	113.....	60.....	6,150.....	150,000.....	46,880.....
A Rock College.....	Rockford, Ill.....	Rev. Bro. Abraham.....	R. C.....	1857.....	14.....	126.....	75.....	7,500.....	65,000.....	0.....
B Rose Polytechnic Inst.....	Nashville, Tenn.....	Owen James, D. D.....	Bapt.....	1863.....	9.....	112.....	12.....	5,000.....	125,000.....	1,200.....
B Rose Polytechnic Inst.....	Terre Haute, Ind.....	Rev. G. M. Ward, A. M.....	None.....	1885.....	19.....	120.....	50.....	3,500.....	67,000.....	600,000.....
A Rutgers College.....	Jersey City, N. J.....	C. Leo Mees, Ph. D.....	None.....	1883.....	20.....	104.....	100.....	8,500.....	200,000.....	125,000.....
B Rutgers College.....	Holly Springs, Mo.....	W. W. Foster, Jr., D. D.....	M. E.....	1869.....	15.....	185.....	99.....	38,562.....	10,000.....	0.....
A St. Bede College.....	New Brunswick, N. J.....	Austin Scott, LL. D.....	Dutch Ref.....	1776.....	35.....	296.....	.....	38,562.....	10,000.....	0.....
A St. Benedict's College.....	Peru, Ill.....	W. E. Abernethy, A. M.....	None.....	1853.....	9.....	147.....	32.....	6,000.....	85,000.....	105,000.....
A St. Benedict's College.....	Archbishop, Kan.....	Very Rev. V. Huber, O. S. B.....	R. C.....	1891.....	9.....	67.....	30.....	7,000.....	80,000.....	40,000.....
A St. Bernard College.....	Newark, N. J.....	George Bien, O. S. B.....	R. C.....	1858.....	24.....	155.....	50.....	17,000.....	80,000.....	40,000.....
A St. Bernard College.....	Allegany, N. Y.....	Benedict Menges, O. S. B.....	R. C.....	1868.....	9.....	80.....	.....	1,200.....	25,000.....	0.....
A St. Bonaventure's College.....	Allegany, N. Y.....	Joseph F. Butler, O. S. B.....	R. C.....	1859.....	1.....	112.....	.....	3,000.....	90,000.....	0.....
A St. Charles' College.....	Ellicott City, Md.....	C. B. Schrantz, S. S., A. M.....	R. C.....	1824.....	22.....	167.....	60.....	8,017.....	384,000.....	0.....
A St. Charles' College.....	St. Charles, Mo.....	C. L. Wolcott, A. M.....	R. C.....	1848.....	20.....	210.....	.....	13,210.....	150,000.....	0.....
A St. Edward's College.....	Austin, Tex.....	P. P. Klein, C. S. C.....	R. C.....	1824.....	6.....	70.....	.....	500.....	50,000.....	0.....
A St. Francis' College.....	Brooklyn, N. Y.....	Bro. Jerome, O. S. F.....	R. C.....	1888.....	20.....	50.....	.....	8,000.....	110,000.....	0.....
A St. Francis Xavier College.....	Quincy, Ill.....	Rev. P. N. Leonard, O. F. M.....	R. C.....	1859.....	25.....	243.....	60.....	4,140.....	160,500.....	0.....
A St. Francis Xavier College.....	Manhattan, N. Y.....	Rev. T. E. Murphy, S. J.....	R. C.....	1860.....	14.....	198.....	47.....	4,500.....	150,000.....	0.....
A St. Ignatius' College.....	San Francisco, Cal.....	Very Rev. J. P. Frieden, S. J.....	R. C.....	1847.....	86.....	733.....	60.....	50,000.....	750,000.....	0.....
A St. Ignatius' College.....	Chicago, Ill.....	Rev. John Pable.....	R. C.....	1855.....	225.....	377.....	100.....	26,463.....	800,000.....	0.....
A St. Ignatius' College.....	Cleveland, O.....	Rev. G. J. Schutte, S. J.....	R. C.....	1869.....	26.....	455.....	50.....	30,000.....	300,000.....	0.....
A St. John's College.....	Annapolis, Md.....	Thos. Fell, LL. D.....	None.....	1886.....	14.....	184.....	40.....	7,000.....	350,000.....	1,400,000.....
A St. John's College.....	Annapolis, Md.....	Thos. Fell, LL. D.....	None.....	1865.....	13.....	135.....	107.....	6,000.....	300,000.....	500.....

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A	St. John's College.....	Brooklyn Rose, N. Y. C.	Very Rev. J. J. Sullivan, G.M.	R. C.	1870	13	983	\$70	10,000	\$438,900	\$
A	St. John's College.....	Fordham, N. Y. C.	Rev. T. J. Campbell, A.M.	R. C.	1866	26	268	80	37,000	1,000,000	0
B	St. John's Lutheran College.....	Winfield, Kan.	Rev. A. A. Meyer	Luth.	1883	27	136	60	500	40,000	0
A	St. John's University.....	Collegeville, Minn.	Rt. Rev. Peter Engel, Ph. D.	R. C.	1867	27	260	120	2,000	800,000	0
A	St. Joseph's College.....	Cincinnati, O.	Rev. M. Scherer, C. S. C.	R. C.	1871	7	82	60	10,000	50,000	0
A	St. Joseph's Diocesan College.....	Teutopolis, Ill.	Hugoline Stortz, O. S. F.	Univ.	1862	10	195	56	5,000	100,000	0
B	St. Lawrence University.....	Canton, N. Y.	John C. Lee, S. T. D.	Univ.	1860	19	144	56	12,896	109,000	\$44,000
A	St. Leo Military College.....	St. Leo, Fla.	Rt. Rev. F. Charles, O. S. B.	R. C.	1860	6	35	2,500	25,000	900,000	0
C	St. Louis' College.....	San Antonio, Tex.	Bro. John Wolf	R. C.	1864	14	108	40	900	900,000	0
C	St. Louis' Seminary.....	Jennings, Mo.	B. T. Blewett, LL.D.	None	1871	6	20	2,000	60,000	800,000	0
A	St. Louis' University.....	St. Louis, Mo.	Rev. J. Grinnelsman, S. J.	R. C.	1829	29	399	80	40,000	800,000	0
A	St. Mary's College.....	St. Mary's, Kan.	Rev. Jas. McCabe, S. J.	R. C.	1869	25	285	30	7,500	180,000	0
A	St. Mary's College.....	Belmont, N. C.	Rev. J. Fehrenbach, D. D.	R. C.	1820	10	130	100	4,000	40,000	0
A	St. Mary's College.....	Knoxville, Ill.	Leo Hald, D. J., O. S. B.	R. C.	1878	13	95	100	10,000	100,000	0
C	St. Mary's School.....	Galveston, Tex.	Rev. John B. Quinlan, S. J.	P. E.	1868	14	111	60	2,800	100,000	8,000
A	St. Meinrad College.....	Northfield, Minn.	A. Schmitt, O. S. B.	R. C.	1854	16	308	60	2,800	200,000	0
B	St. Olaf College.....	Northfield, Minn.	Rev. Thos. N. Mohr	R. C.	1857	16	110	15	14,000	125,000	0
B	St. Paul's College.....	St. Paul Park, Minn.	Rev. C. W. Hertzler, A.M.	Luth.	1874	10	109	89	2,000	32,500	6,048
A	St. Stephen's College.....	Annandale, N. Y.	Geo. B. Hopron, D. D.	M. E.	1869	6	89	0	1,800	41,000	15,000
A	St. Vincent's College.....	Bourbonnais, Ill.	Rt. Rev. Leander Schmitt, O. S. B.	P. E.	1874	40	200	200	17,031	254,820	150,000
A	St. Vincent's College.....	Beatty, Pa.	Rev. M. J. Marsile, C. S. V.	R. C.	1846	20	270	60	88,000	150,000	0
A	St. Xavier College.....	Los Angeles, Cal.	Rev. J. A. Linn, C. M.	R. C.	1865	16	160	50	3,000	55,000	0
A	Salem Female Academy.....	Cincinnati, O.	Rev. M. J. O'Connor, S. J.	R. C.	1831	24	454	60	17,300	100,000	0
C	Salem Female Institute.....	Salem, N. C.	Rev. J. C. Clewell	Presb.	1804	34	274	40	6,000	200,000	10,000
A	San Francisco Theol. Sem.....	San Anselmo, Cal.	Hy. Collin Minton, D. D. (Clerk of the Fac.)	Morav.	1871	7	34	19,000	225,000	350,000	0
A	Santa Clara College.....	Santa Clara, Cal.	Rev. Robert E. Kenna	R. C.	1857	23	214	44	1,000	85,000	0
B	Sayre Female Institute.....	Lexington, Ky.	Il. B. McClelland, A.M.	M. E. So.	1854	6	133	44	1,000	35,000	0
B	Scot College.....	Scio, O.	John Wedr, A. M., D. D.	Presb.	1854	10	100	36	2,500	50,000	0
B	Scotia Seminary (colored).....	Concord, N. C.	D. J. Satterfield, D. D.	M. E.	1886	16	310	56	1,800	65,000	0
A	Sem. of St. Francis of Sales.....	St. Francis, Wis.	Joseph Balner	Presb.	1870	17	225	56	13,000	25,000	0
A	Seminary West of the Seewance.....	Tallahassee, Fla.	A. A. Murphree, A. B.	R. C.	1856	14	225	60	1,250	500,000	65,000
A	Seton Hall College.....	See University of the South.	Rev. John A. Stafford	None	1857	6	146	0	1,250	25,000	0
B	Sewanee University (colored).....	See University of the South.	C. F. Meserve, A. M.	R. C.	1856	17	160	60	15,000	500,000	0
B	Shaw University.....	See Denison University.	T. J. Simmons, A. M.	Bapt.	1865	24	352	19	1,500	180,000	81,000
C	Shorthall College.....	Rome, Ga.	A. K. de Blois, Ph. D.	Bapt.	1877	19	165	59	5,000	150,000	40,000
B	Shurtliff College.....	Upper Alton, Ill.	George J. Ramsey, A. M.	Bapt.	1867	24	146	19	9,000	100,000	118,000
C	Silliman Female Inst.....	Clinton, La.	Rev. Fletcher Brown, A. M.	Presb.	1852	14	116	60	1,100	50,000	31,000
B	Simpson College.....	Indianola, Ia.	L. C. Seelye, D. D.	M. E.	1867	17	443	37	8,900	100,000	65,078
C	Smith College.....	Northampton, Mass.	Miss V. O. Wardlaw, A. M.	None	1875	63	979	100	7,500	959,583	667,389
C	Soule Female College.....	Murfreesboro, Tenn.		M. E.	1852	13	175	70	500	15,000	0

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B	South Carolina College.....	Columbia, S. C.	F. C. Woodward, Litt. D.	None.	1801	12	189	\$58	30,000	\$300,000	\$
B	S. C. Military Academy.....	Charleston, S. C.	Asbury Coward, LL. D.	None.	1843	9	125	0	9,000	85,000	0
B	S. Dakota Ag. College.....	Brookings, S. Dak.	John W. Heston.....	None.	1894	14	400	12	9,000	80,000	0
B	S. Dakota State School of Mines.....	Rapid City, S. Dak.	V. T. McGillycuddy.....	None.	1896	5	21	0	500	30,000	0
B	South Dakota, Univ. of.....	Vermillion, S. Dak.	Garrett Drovers.....	None.	1882	30	377	9	4,402	92,000	494,800
C	Southern Baptist Theol. Sem.....	Louisville, Ky.	E. Y. Mullins, D. D.	Bapt.	1859	8	261	69	25,000	324,868	0
C	Southern Female College.....	College Park, Ga.	C. C. Cox, Ph. D.	Bapt.	1843	25	197	57	5,000	53,000	0
C	Southern Female College.....	La Grange, Ga.	G. A. Nunnally, D. D.	Bapt.	1843	24	206	87	2,000	40,000	0
C	Southern Female College.....	Petersburg, Va.	Arthur K. Davis, A. M.	None.	1863	12	100	80	100	100,000	50,000
B	Southern University.....	Greensboro, Ala.	S. M. Homer, D. D.	M. E. So.	1866	9	153	150	7,000	75,000	0
B	South Kentucky College.....	Hopkinsville, Ky.	S. S. Woolwine.....	Christ.	1849	10	175	50	2,500	50,000	0
B	Southwest Baptist College.....	Bolivar, Mo.	Jas. Rice, A. M.	Bapt.	1845	5	138	18	3,000	60,000	0
B	Southwest Kansas College.....	Winfield, Kan.	C. A. Place, A. M., B. D.	M. E.	1895	16	251	30	2,000	50,000	0
B	Southwestern Bapt. University.....	Jackson, Tenn.	G. M. Savage, A. M., LL. D.	Bapt.	1845	81	273	60	4,000	50,000	70,000
B	Southwestern Presb. University.....	Clarksville, Tenn.	Geo. Summey, D. D.	Presb.	1875	10	125	71	8,000	60,000	190,000
B	Southwestern Virginia Inst.....	Georgetown, Tex.	J. R. Allen, D. D.	M. E. So.	1872	10	335	65	5,000	80,500	0
B	Spring Hill College.....	Bristol, Va.	W. H. Thorp, A. M.	Bapt.	1884	15	183	60	1,000	150,000	0
C	State College of Kentucky.....	Stanford, Ky.	Very Rev. M. Moynihan, S. J.	R. C.	1880	18	108	100	30,000	250,000	0
C	Stevens' College.....	Londonville, Ky.	William Shelton.....	None.	1871	7	96	58	500	4,000	0
C	Stevens' Inst. of Technology.....	Columbia, Mo.	Jas. K. Patterson, Ph. D., LL. D.	None.	1892	80	450	150	2,500	450,000	30,000
C	Stone College for Young Ladies.....	Hoboken, N. J.	S. F. Taylor, D. D.	Bapt.	1869	19	99	46	500	125,000	475,000
C	Stonestown College.....	Meridian, Miss.	Henry Morton, Ph. D., LL. D.	None.	1871	21	375	2150	9,800	387,000	0
C	Stonestown College.....	Arlington, Va.	Lewis M. Stone, D. D.	Bapt.	1893	6	85	40	100	12,500	0
C	Stonestown College.....	New Orleans, La.	Kate M. Hunt.....	Presb.	1899	8	79	40	400	30,000	0
C	Stonestown College.....	Bristol, Tenn.	Oscar Atwood, A. M.	Cong.	1899	8	50	8	8,500	125,000	8,000
C	Stonestown College.....	Selma, Ala.	Rev. S. N. Barker.....	M. E. So.	1899	13	100	0	2,500	50,000	5,000
C	Stonestown College.....	Selma, Ala.	J. R. Dimm, A. M., D. D.	Presb.	1893	13	173	61	5,000	47,000	43,000
C	Stonestown College.....	Selma, Ala.	Wm. J. Birdsell, B. S.	Friends	1894	23	162	0	18,175	500,000	260,000
C	Synodical Female College.....	Sweetwater, Tenn.	J. L. Bachman, A. M.	None.	1874	9	119	32	500	20,000	0
C	Synodical Female College.....	Rogersville, Tenn.	William M. Graybill.....	Presb.	1874	16	173	36	1,000	40,000	0
C	Syracuse University.....	Syracuse, N. Y.	J. R. Day, S. T. D., LL. D.	M. E.	1871	17	173	89	42,618	958,500	1,311,868
C	Tabor College.....	Tabor, Ia.	Rev. R. C. Hughes.....	Cong.	1866	17	173	89	8,100	43,800	84,060
C	Talladega College.....	Talladega, Ala.	Rev. R. C. Hughes.....	Cong.	1866	17	173	89	8,100	43,800	84,060
C	Tarkio College.....	Tarkio, Mo.	J. A. Thompson, D. D.	Presb.	1883	14	231	35	1,081	80,000	59,000
C	Teachers' College.....	Upland, Ind.	T. C. Reade, A. M., D. D.	M. E.	1847	21	156	36	2,000	50,000	0
C	Tennessee Female College.....	Franklin, Tenn.	T. E. Allen.....	None.	1866	12	110	50	1,000	15,000	0
C	Tennessee Female College.....	Knoxville, Tenn.	C. W. Bailey, LL. D.	None.	1794	59	998	80	12,000	598,000	425,000
C	Texas, University of.....	Austin, Tex.	T. B. Rabb, D. D.	None.	1863	71	800	10	85,000	508,000	860,016
C	Thiel College.....	Greenville, Pa.	T. B. Rabb, D. D.	Luth.	1840	7	147	80	6,500	134,270	300,000
C	Thiel College.....	Greenville, Pa.	Barton Grubb, A. M.	None.	1840	7	147	80	6,500	134,270	300,000
C	Thiel College.....	Greenville, Pa.	W. A. Edwards, A. M.	None.	1891	30	216	105	1,050	70,000	38,300
C	Thiel College.....	Greenville, Pa.	J. C. Kilgo, A. M., D. D.	M. E. So.	1894	14	155	04	15,000	240,000	225,000

a To residents; \$225 to non-residents.

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B	Washburn College.....	Topeka, Kan.	G. M. Herrick, A.M.	Cong.	1865	17	284	\$40	7,500	\$250,000	\$65,000
B	Wash. Ac. Col. and Sch. of Science.....	Pullman, Wash.	Knock A. Bryan.....	None.	1892	28	388		8,430	184,400	3,500
B	Washington College.....	Chestertown, Md.	C. W. Reid, Ph.D.	None.	1783	8	110	50	2,500	50,000	30,000
B	Washington College.....	Wash. Coll., Tenn.	Rev. J. T. Cooley, M.A.	None.	1785	8	146	31	2,000	40,000	5,000
B	Washington University.....	St. Louis, Mo.	W. S. Chaplin, LL.D.	None.	1853	154	1,428	150	5,000	850,000	950,000
B	Washington University of.....	Seattle, Wash.	F. P. Graves, Ph.D., LL.D.	None.	1893	21	289	0	7,688	850,000	0
A	Washington and Jefferson Col.	Washington, Pa.	Jas. D. Moffat, D.D.	None.	1862	16	301	0	14,000	850,000	377,991
B	Washington and Lee Univ.	Lexington, Va.	W. L. Wilson, LL.D.	None.	1749	94	140	80	40,000	300,000	639,800
B	Waverly College.....	Waverly, Mass.	Rev. George F. Kirby, M.A.	M. E. So.	1873	6	180		900	30,000	7,000
B	Wellesley College.....	Wellesley, Mass.	Miss Caroline Hazard.....	M. E. So.	1875	76	671	175	48,435	1,098,000	7,000
C	Wells College.....	Aurora, N. Y.	W. F. Waters, Ph.D.	None.	1868	19	107	100	6,500	175,000	300,000
C	Western Female College.....	Macon, Ga.	John D. Hammond, D.D.	M. E. So.	1880	26	211	54	8,000	300,000	50,000
C	Western Female College.....	Brownsville, Tenn.	T. W. Crowder, D.D.	M. E. So.	1870	7	80		1,800	19,500	1,500
B	West Virginia University.....	Middletown, Conn.	E. S. Whitman, A.M.	M. E. So.	1891	26	827	108	48,000	543,080	1,940,009
C	Westbank University.....	Deerling, Me.	Lella S. McKee, Ph.D.	Uniters	1884	7	100	85	3,200	100,000	82,000
C	Western College and Sem.	Orford, N. H.	Lella S. McKee, Ph.D.	Uniters	1884	26	148		3,200	184,484	48,500
B	Western College.....	Toledo, Ind.	L. Bookwalter, D.D.	U. B.	1853	18	198	36	5,000	70,000	0
B	Western Maryland College.....	Westminster, Md.	T. H. Lewis, A.M., D.D.	Meth. Prot.	1867	18	247	45	5,000	150,000	1,300,000
B	Western Reserve University.....	Cleveland, O.	Chas. F. Thwing, D.D.	None.	1869	122	758	75	87,000	700,000	340,000
B	Western Univ. of Penn.	Allegheny, Pa.	W. J. Holland, D.D.	None.	1819	103	684	106	15,000	285,000	1,000
A	Westfield College.....	Westfield, Ill.	Wm. S. Reese, Ph.M.	U. B.	1863	6	108	20	2,500	40,000	910,000
A	Westminster College.....	Fulton, Mo.	J. F. Rice (act.), D.D.	Presb.	1853	9	108	50	6,000	45,000	300,000
B	West Virginia University.....	New Wilmington, Pa.	E. G. Ferguson, Ph.D.	United Presb.	1864	12	294	42	12,000	250,000	300,000
B	West Virginia University.....	Morgantown, W. Va.	J. H. Blanchard, Ph.D.	None.	1867	42	644	7	15,000	300,000	114,750
B	Wheaton College.....	Wheaton, Ill.	C. A. Blanchard, D.D.	Cong.	1860	18	231	80-82	3,000	128,388	32,000
B	Whitman College.....	Walla Walla, Wash.	S. B. L. Fenrose, A.B., D.D.	Cong.	1869	16	133	46	6,000	35,000	150,000
B	Whitworth College.....	Sumner, Wash.	Robt. Boyd, D.D.	Cong.	1869	7	38	36	650	19,000	0
B	Whitworth Female College.....	Brookhaven, Miss.	John W. Chambers, A.M.	Presb.	1860	7	38	36	650	19,000	0
C	Wilberforce Univ. (colored).....	Wilberforce, O.	S. T. Mitchell, LL.D.	M. E.	1857	13	170	39	800	70,000	44,165
B	Wiley University (colored).....	Marshall, Tex.	Rev. M. W. Dogan, A.M.	M. E.	1896	20	323	23	6,000	135,000	0
B	Willamette University.....	Salem, Ore.	W. C. Hawley, A.M.	M. E.	1873	8	139	10	2,000	48,000	0
A	William and Mary College.....	Williamsburg, Va.	L. G. Tyler, LL.D.	None.	1844	44	106	52	4,518	300,000	40,000
A	Williams College.....	Liberty, Mo.	J. P. Greene, D.D.	Bapt.	1868	10	158	41	10,500	125,000	125,000
A	Williamson Female College.....	Williamstown, Mass.	Franklin Carter, LL.D.	None.	1849	23	339	50	10,500	100,000	300,000
C	Williamson College.....	Williamstown, S. C.	S. Lander, A.M.	None.	1788	30	383	113	40,750	482,438	1,048,317
B	Wilkes College.....	Chambersburg, Pa.	S. B. Unthank, M.S.	Presb.	1870	8	110	51	2,500	15,000	40,000
B	Wilkes Univ. of.....	Chambersburg, Pa.	S. B. Unthank, M.S.	Presb.	1870	8	110	51	2,500	15,000	40,000
B	Wittenberg College.....	Madison, Wis.	S. K. Adams, LL.D.	None.	1870	30	383	60	6,000	150,000	150,000
B	Wofford College.....	Springfield, O.	S. K. Adams, LL.D.	None.	1849	129	1,063	12	54,000	175,000	30,000
B	Woman's College.....	Springfield, S. C.	S. A. Gaillet, LL.D.	M. E. So.	1864	11	203	50	10,000	125,000	63,000
C	Woman's College.....	Frederick, Md.	J. H. Apple, A.M.	Ref.	1863	17	119	50	9,000	50,000	28,000
C	Woman's College of Baltimore.....	Oxford, Mass.	Rev. J. W. Malone, A.M.	'Cumb. Pres.	1864	17	147	136	8,000	60,000	387,000
C	Woman's College of Baltimore.....	Baltimore, Md.	John F. Goucher, D.D.	M. E.	1866	27	326		7,400	690,000	387,000

*Foreign universities, etc., arranged
according to number of students.
(From the U. S. Commissioner's Report.)
(The attendance stated is that of 1897.)*

Sex.	Name.	Location.	President.	Denomination.	Organized.	Officers of Instruction.	Students.	Collegiate Expenses.	Bound Volumes in Library.	Value of Grounds and Buildings.	Amount of Productive Funds.
A	Worcester Poly. Inst.	Worcester, Mass.	T. C. Mendenhall, LL.D.	None.	1885	20	916	\$169	4,900	\$500,000	\$310,000
B	Wyoming Univ. of	Laramie, Wyo.	Rev. E. R. Snoddy, A.B.	None.	1887	14	168	13	5,750	111,540	3,772,782
B	Yale University	New Haven, Conn.	Arthur C. Bradley, M.A., LL.D.	Cong.	1701	250	2,468	185	283,000	150,000	55,360
B	Yankton College	Yankton, S. D.	Rev. H. K. Warren, A.M.	Cong.	1881	15	168	30	6,253	82,000	0
C	York College	York, Neb.	Wm. K. Schell, A.M.	U. B.	1880	10	184	26	4,066	30,000	0
C	Young Female College	Thomasville, Ga.	John E. Baker	None.	1870	4	86	80	500	20,000	0
B	Young Harris College	Young Harris, Ga.	W. F. Robinson	M. E. So.	1885	10	233	10	500	20,000	0

* Co-educational in graduate courses only.

Locality.	Number of students.
Paris.	12,047
Berlin.	10,808
Madrid.	6,143
Vienna.	5,710
Naples.	5,108
Moscow.	4,461
Budapesth.	4,407
Munich.	4,185
St. Petersburg.	3,615
Athens.	3,558
Oxford.	3,408
Leipsic.	3,377
Manchester (about).	3,000
Cambridge.	2,929
Prague (Bohemian).	2,858
Edinburgh.	2,850
Kiev.	2,765
Turin.	2,551
Lyons.	2,198
Bordeaux.	2,144
Helsingfors.	2,135
Copenhagen.	2,000
Rome (Royal University).	1,914
Tokio.	1,898
Barcelona.	1,887
Toulouse.	1,885
Glasgow.	1,880
Gratz.	1,771
Halle.	1,764
Bonn.	1,743
Bucharest.	1,736
Louvain.	1,689
Freiburg (Germany).	1,641
Bologna.	1,580
Padua.	1,587
Kharkov.	1,578
Lemberg.	1,507
Upsala.	1,504
Montpellier.	1,493
Breslau.	1,488
Coimbra.	1,439
Warsaw.	1,427
Wurzburg.	1,425
Liege.	1,424
Pavia.	1,383
Lille.	1,354
Urbana.	1,337
Prague (German).	1,336
Dorpat (Jurgew).	1,334
Favia.	1,325
Toronto.	1,323
Brussels.	1,316
Göttingen.	1,290
Tübingen.	1,257
Salamanca.	1,247
Warsaw.	1,248
Havana.	1,236
Heidelberg.	1,208
Christiania.	1,200
Strasbourg.	1,159
Manila.	1,144
Dublin.	1,128
Amsterdam.	1,124
Montreal.	1,097
Erlangen.	1,085
Pisa.	1,086
Manchester (Owens College).	1,083
Rennes.	1,083
Rome (University Pont.).	1,019
Genoa.	1,010
Nancy.	1,000
Santiago (Chile), about.	1,000
Marburg.	965
Innsbruck.	945
Catania.	908
Zürich.	876
Utrecht.	873
Kasan.	850
Aix-en-Provence.	849
Klausenburg.	833
Berne.	819
Leyden.	819
Geneva.	813
Aberdeen.	798

URUGUAY, the smallest republic of South America, is bounded on the north by Brazil, on the east by Brazil and the Atlantic Ocean, on the south by the Atlantic Ocean, and on the west by Argentina. The capital is Montevideo.

Area and Population.—There are 19 departments, or provinces, the estimated area of which is 72,110 square miles. The smallest and most densely populated department is Montevideo, area 256 square miles, population (estimated in 1897) 264,838; the largest and most sparsely populated department is Tacuarembó, area 8074 square miles, population (estimated in 1897) 27,929. A regular census has never been taken; the estimated population in 1879 was 438,245, and in 1898, 840,725. Immigrants number about 10,000 a year and emigrants about 6000. In 1897 the more important countries represented among the immigrants were, in the order of their numbers, Italy, Spain, Brazil, France, Germany, and England. About 70 per cent. of the inhabitants are native born. Montevideo is the only large city, and has a population of about 249,250.

Government.—According to the constitution of Uruguay, which dates from July, 1830, the executive authority devolves upon a president, elected for a term of four years, who is assisted by a cabinet of five departments—the interior, foreign affairs, war and marine, instruction and public works, and finance. The president is Señor Juan Lindolfo Cuestas. The legislative authority devolves upon a parliament of two houses, the senate and the chamber of deputies, which hold annual sessions from February 15 to July 15. The legislative power *ad interim* is assumed by a permanent committee of two senators and five representatives. Each of the departments is represented in the parliament by one senator, who is chosen for a term of six years by an electoral college, the members of which are elected by popular vote. There are about seventy representatives, elected for three years, in the proportion of one to each 3000 male adults able to read and write.

Army and Navy.—The regular army comprises four battalions of infantry and four cavalry and one artillery regiment, numbering in all 233 officers and 3222 men. There are 3200 armed police, and a national guard of about 20,000. The navy consists only of one small steamer and three gunboats, the complement being 184 officers and men. There is a military college with 8 professors and 41 cadets.

Finance.—The chief source of revenue is customs, and the principal expenditures are interest on the public debt, administrative expenses, and pensions. The approximate revenue for the fiscal year 1898 was 14,257,722 pesos. Early in 1899 the revenue and expenditure for the fiscal year 1899 were estimated at 15,973,546 pesos and 15,799,231 pesos respectively. Subsequently, however, President Cuestas reported a deficit of about 1,500,000 pesos. The budget for the fiscal year 1900, presented June 16, 1899, showed an estimated revenue of 15,977,990 pesos, and an estimated expenditure of 15,969,698 pesos. Service of the foreign debt, grants, pensions, and railway guarantees required 9,120,209 pesos of the total expenditure. According to the *Bulletin* of the Bureau of American Republics, the *dirección-general* of statistics of the government of Uruguay reported custom-house receipts as follows: For fiscal year 1899, import duties, 8,358,696 pesos; export duties, 1,375,945 pesos; total, 9,734,641 pesos; for fiscal year 1898, import duties, 8,191,003 pesos; export duties, 1,376,637 pesos; total, 9,567,640 pesos. The national debt, of which about four-fifths is external, was reported to amount in October, 1898, to 128,265,097 pesos. The finances of the city of Montevideo are kept distinct from the national budget. The value of the peso in United States currency is \$1.034.

Industries and Commerce.—Though agricultural interest is increasing, by far the most important industry is the raising of sheep and cattle. There were reported for 1896: Sheep, 16,397,484; cattle, 5,881,402; horses, 392,246; mules, 15,589. The value of the flocks and herds is placed at somewhat more than 73,000,000 pesos. The wool produced in 1896-97 amounted to 33,000 tons; for the same year the wheat crop was estimated at 300,000 tons. The wool clip for the year 1897-98 amounted to about 114,371,400 pounds, the average price a pound in United States currency being 11 cents; for 1898-99, 102,294,540 pounds, average price 12½ cents; the estimate for 1899-1900, something more than 97,000,000 pounds, with an average price of 25 cents. Thus the income from wool in this last year will be nearly double that of the year previous. The number of cattle slaughtered in Uruguay for packing purposes in fiscal years has been reported as follows: 1896, 723,400; 1897, 683,300; 1898, 665,300; 1899, 821,600. To some extent tobacco, olives, and grapes are cultivated. In the northern provinces are found gold, silver, lead, magnesium, copper, and lignite; little attention, however, is paid to mining. Wool, jerked beef, hides and skins, and other products of the herds constitute the principal exports; the chief imports are machinery and raw materials, textiles, comestibles, and liquors. The value in pesos of imports and exports was: In 1897, imports, 19,512,212; exports, 29,301,571; in 1898, imports, 24,784,356; exports, 30,276,914. Of the last amount 26,243,492 pesos represented animal products (exclusive of live stock), and 3,315,543 pesos agricultural products. Exports of wheat were valued at 2,406,716 pesos,

and of wheat flour at 601,219 pesos. According to the *Montevideo Times*, the exports and imports for the first six months of 1899 amounted respectively to 21,605,123 pesos and 12,963,763 pesos; for the corresponding period of 1898 the exports amounted to 18,250,026 pesos, and the imports to 13,246,372 pesos; for the corresponding period of 1897, exports 17,527,944 pesos, and imports 9,271,205 pesos. The imports are principally from Great Britain, Argentina, Germany, France, Italy, Spain, the United States, Belgium, and Brazil; to these also the exports are chiefly sent, the most important being Brazil, Belgium, France and Argentina. Trade with the United States seems to be increasing.

Shipping and Communications.—In 1897 there entered at Montevideo from foreign ports 1126 vessels aggregating 1,904,626 tons, and cleared 1024 vessels of 1,796,529 tons; the river and coasting trade was: Vessels entered, 2439; tonnage, 621,406; cleared, 2447; tonnage, 621,244. The merchant marine in 1895 comprised 64 vessels, steam 19, aggregating 4608 tons net, and sail 45, of 13,171 tons net.

The following statistics of the Uruguayan railways are taken from reports (April, 1899) of the United States minister and the United States consul at Montevideo:

Railway.	Length in Miles.	Invested Capital.
Central Uruguayan Railway:		
Main line.....	199	\$18,760,421
Eastern extension.....	360	14,780,874
Northern ".....	188	7,860,480
Total.....	747	\$36,501,285
Western Railway.....	283	12,150,000
Great Eastern of Uruguay.....	260	10,192,851
Midland of Uruguay.....	196	7,708,889
Northwestern of Uruguay.....	110	4,888,500
Central Northeastern.....	77	3,888,000
Northern Railway of Uruguay.....	71.8	2,857,867
Northern Railway.....	14	740,440
Total.....	1,792.8	\$78,959,992

The government guarantees interest on the railway bonds, they being formerly 5 per cent., but now $3\frac{1}{4}$. Consequent deficits in the seven years, 1892-98, amounted to \$5,875,628. The Interior Railway Company, having a capital of \$15,011,187, has been formed and projects a line of 617 kilometres (383 miles). Toward the close of 1899 it was announced that the government had granted a concession for the building of a narrow-gauge railway from Algota, on the Uruguay Central Railroad, to the port of Independencia, with branches to Mercedes and Nuevo Berlin. There are 89 miles of tramway in operation. The principal telegraph lines in 1897 aggregated a length of 4370 miles, of which 982 belonged to the railways. There were 97 telegraph offices and 636 post-offices.

Religion and Education.—The state religion is Roman Catholic, but all other faiths are tolerated. The proportion of Protestants to Catholics is about one to sixteen. Primary education is compulsory. The last report obtainable, made in the early part of 1898 for the year 1896, places the number of public primary schools at 533, with 1041 teachers (258 male and 783 female), and an enrolment of 51,312 pupils. The private schools numbered 379, with 949 teachers and 22,689 pupils. There is one pupil for each eleven inhabitants, a proportion which, though small, is larger than that of any other South American country. The cost of primary education defrayed by the state is about 677,000 pesos. The high-school system is not known. There are two normal schools. The government supports a school of arts and trades, having about 200 students. The university at Montevideo, under government control, has collegiate, law, medical, and engineering departments; the enrolment in 1896 was 87 professors and 587 students. Besides the institutions mentioned there are many religious seminaries. There is a national museum and a national library. It is reported that about 126 periodicals are published in Uruguay; 120 are Spanish, 2 Italian, and 2 English.

History.—During the month of February, 1899, revolutionary attempts were reported, but they were unsuccessful and of little importance. On March 1, 1899, Señor Juan Lindolfo Cuestas was elected to the presidency for the term of four years. He was vice-president when President Idiarte Borda was assassinated in August, 1897, and on the 25th of that month assumed the presidency *ad interim*. He continued as acting president until elected for the regular term. When the congress adjourned on November 27, 1899, the government had a large majority, and the political situation seemed to be peaceful.

UTAH, a Western State of the United States, has an area of 84,970 square miles. Capital, Salt Lake City. Utah was admitted as a State in 1896.

Mineralogy.—Revised reports for 1898 showed the production of silver to have been 6,485,900 fine ounces; coining value, \$8,385,810, and gold, 110,556 fine ounces, value, \$2,285,400—both in excess of official estimates. The estimates for 1899 were, silver, \$9,696,969, and gold, \$3,369,509. Copper in 1898 yielded 3,750,000 pounds; lead, 39,299 short tons; and coal, from 20 mines, 593,709 short tons, valued at \$752,252, an increase both in production and price. Quarry products were: Granite, \$3545; sandstone, \$15,752, and limestone, \$11,721—total, \$31,018; and 6 salt plants yielded 405,179 barrels of all kinds, valued at \$196,056. During 1899 there was a large inflow of capital for investment, especially from the Eastern States and for copper properties. A number of extensive consolidations were made; rich iron deposits and excellent coking coal were found together near Cedar City; the first copper reduction works erected in the State was started, and in June shipped 10,000 tons of pig-copper; and in midsummer arrangements were completed for beginning the shipment of guano from Gunnison and Hat Islands, Great Salt Lake, to San Francisco. Local authorities reported the following shipments during the year: Silver-lead ores, 89,925,277 pounds; silver-lead bullion, 50,017,257 pounds; copper bullion, 7,812,875 pounds, and copper ore, 30,000 pounds—total, 147,785,359 pounds. To haul this output 3775 railways cars were used. The increase in the value of the mineral output over that of 1898 was more than \$2,000,000, and the total amount paid in dividends by Utah mines during the year was \$1,914,500, an increase of \$312,750 over the total of 1898. See ABRASIVES.

Railways.—The new railway construction in the calendar year 1898 was 38.75 miles, and in 1899, 101.60 miles, giving the State a total mileage of 1581.13.

Banks.—On October 31, 1899, there were 11 national banks in operation and 6 in liquidation. The active capital aggregated \$1,650,000; circulation, \$756,371; deposits, \$4,835,753, and reserve, \$2,001,609. The State banks, June 30, 1899, numbered 11, and had capital, \$835,000; deposits, \$5,181,428, and resources, \$6,253,664; and stock savings banks, 8, with capital, \$581,800; depositors, 5217; deposits, \$1,742,972, and resources, \$2,939,103. The exchanges at the United States clearing house at Salt Lake City, in the year ending September 30, 1899, aggregated \$116,111,560, an increase of \$30,356,286 in a year.

Education.—At the close of the school year 1897-98, the school population was 83,196; enrolment in the public schools, 70,878, and average daily attendance, 49,638. There were 1339 teachers, 675 buildings used as school-houses, and public school property valued at \$2,652,595. The revenue was \$1,154,642; expenditure, \$1,047,174, of which \$563,119 was for teachers' salaries. There were 4 public high schools, with 33 secondary teachers, 891 secondary students, and 71 elementary pupils; 14 private secondary schools, with 87 teachers, 1174 secondary students, and 1337 elementary pupils; 2 public normal schools, with 39 teachers and 613 students in all departments, and 2 private ones, with 42 teachers and 1189 students. Normal training was also given in 2 colleges. Two universities and colleges for men and for both sexes reported 100 scholarships, 37 professors and instructors, 905 students, 19,000 volumes in the libraries valued at \$42,000, \$20,500 invested in scientific apparatus, \$325,000 in grounds and buildings, and \$196,427 in productive funds, and \$82,948 in total income. In 1899 there were 76 periodicals, of which 6 were dailies, 53 weeklies, and 8 monthlies.

Finances.—The total assessed valuation for 1898 was \$100,241,331, a decrease of \$2,195,852 in a year; estimated real value, \$250,000,000; tax rate in 1899, \$5 per \$1000, and total bonded debt, February 1, 1899, \$900,000.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 282,000.

Legislature.—The balloting for United States senator began on January 17 and continued on each legislative day until March 10, when the legislature adjourned without making any choice, having taken 161 fruitless ballots. The votes were divided among twenty candidates, one of whom, Martha H. Cannon, received the first vote ever cast for a woman for the United States Senate. The session was notable for exhibitions of bad spirit between members, charges of bribery and personal conflicts. In the end, however, the legislature, by a vote of 33 to 20, postponed action indefinitely on the bribery charges in connection with the canvass. Laws were passed by means of which primary elections are regulated and illegal voting thereat punished. A State institute of art was established, with a State board to govern and control. The State Board of Pardons was given power to parole convicts who have served the minimum term fixed by law, except those convicted of murder. A State fish and game commissioner was appointed with large powers, and each county is to appoint a county game and fish warden. The State Board of Health was granted extraordinary powers, and can extend quarantine regulations. The feeding of cows by dairymen was regulated. A State experimental fruit farm

was established. A new mining law was enacted, among other things, doing away with mining location work, except the assessment work under United States laws.

State Officers and National Representatives.—Governor, Heber M. Wells; secretary of state, J. T. Hammond; attorney-general, A. C. Bishop; auditor, M. Richards, Jr.; treasurer, James Chipman; superintendent of public instruction, J. R. Park. Supreme Court: Chief justice, George W. Bartch; justices, J. A. Miner, R. N. Baskin; clerk, L. P. Palmer. The State legislature consists of 17 Republicans, 42 Democrats, and 4 Fusionists. Senators, Joseph L. Rawlins (Dem.), from Salt Lake City; the other senatorship is vacant. Representative, Brigham H. Roberts (Dem.), of Centreville. See MORMONISM and IRRIGATION.

VACCINATION. See SMALLPOX.

VANDERBILT, CORNELIUS, head of the great Vanderbilt system of railways, died at his home in New York City, September 12, 1899. He was the son of William Henry Vanderbilt, and the grandson of Cornelius ("Commodore") Vanderbilt, the founder of the fortune now amounting to many millions. He was born on his father's farm in New Dorp, Staten Island, November 27, 1843. His grandfather's wealth was of little help to the boy in early life, for the commodore believed he should win his own way. He attended school on Staten Island and in New York, and when about sixteen years of age began work as a messenger in the New York Shoe and Leather Bank. After four years of service there he entered the banking house of his uncles, the Kissam Brothers, and remained with this firm until his grandfather gave him a place in the offices of the New York and Harlem Railroad. At first he acted as assistant treasurer, but soon was made treasurer, which position he retained for ten years. He then resigned the treasurership to accept the vice-presidency of the same road, and subsequently he became president, and held the position to the time of his death. When William H. Vanderbilt died in 1885 Cornelius became the head of the Vanderbilt system of railroads. Having determined to conduct the New York Central and its connecting lines on the English system of management, he became chairman of the board of directors instead of president. Mr. James H. Rutter succeeded to the presidency and he in turn was succeeded by Mr. Chauncey M. Depew. Vanderbilt's time and energy were largely taken up in keeping himself informed concerning the business and in directing the policies of the numerous corporations which the Vanderbilt interests dominated, and which comprise the Vanderbilt system—a system that embraces nearly 10,000 miles of railroad. Its principal lines are: The New York Central, the West Shore, the Michigan Central, the Lake Shore, the Chicago and Northwestern, the Cleveland, Cincinnati, Chicago and St. Louis, the Adirondack and St. Lawrence, the Rome, Watertown and Ogdensburg, the New York and Harlem. Besides being chairman of the New York Central board of directors, Vanderbilt was chairman of the Michigan Central board, and was a director in nearly forty-five other railway corporations that are included in the Vanderbilt system, while he had large interests in the New York, New Haven and Hartford, the Delaware and Hudson, and a number of smaller lines. Cornelius Vanderbilt was public-spirited and generous; his contributions to various philanthropic, educational, and religious causes were many, and often amounted, it is said, to \$1,000,000 a year, or about half his income. The amount of the fortune left by him was variously estimated; its value was probably more than \$70,000,000.

VAN DYKE, HENRY, clergyman and author, was born at Germantown, Penn., November 10, 1852. He was educated at Brooklyn Polytechnic Institute, Princeton College and Theological Seminary, and Berlin University (D.D. Princeton, 1884, Harvard, 1893, Yale, 1896; LL.D. Union, 1898). He married Ellen Reid, of Baltimore, December 13, 1881. He became pastor of the United Congregational Church of Newport, R. I., in 1878, and from 1882 to 1899 was pastor of the Brick Presbyterian Church in New York City, but resigned from the pastorate upon being unanimously elected by the board of trustees to be the first incumbent of the newly endowed Murray chair of English literature at Princeton University. Publications: *The Poetry of Tennyson*; *The Reality of Religion*; *The Story of the Psalms*; *The National Sin of Literary Piracy*; *Little Rivers*; *The Other Wise Man*; *The Gospel for an Age of Doubt*; *The First Christmas Tree*; *The Builders and Other Poems*; *Straight Sermons to Young Men and Other Human Beings*; *The Christ Child in Art*; *Ships and Havens*; *The Lost Word*; *The Toiling of Felix and Other Poems*, and *Fisherman's Luck and Some Other Uncertain Things*, which was published in 1899 and received warm commendation.

VARIATION. See ZOOLOGICAL LITERATURE.

VASSAR COLLEGE, near Poughkeepsie, N. Y., was incorporated in 1861. The most important items to be mentioned in regard to events connected with its history during the past year are the gifts that were received. Among these were three scholarships of \$8000 each, given respectively by Miss Helen M. Gould, of New York; Mr.

D. M. Ferry, of Detroit, and the late Mrs. Luther Elting; a building for an infirmary given by Mrs. E. S. Atwater, of Poughkeepsie; a chapel, the gift of Mrs. W. R. Thompson, of Pittsburg, and Mrs. C. M. Pratt, of New York, and \$30,000 toward a biological laboratory. Changes in the faculty were made by the death of Professor Van Ingen, of the art department, whose place has not yet been filled, and the resignation of Miss Bickford, professor of biology, whose place has been filled by Frank R. Little, Ph.D. The number of candidates who received the degree of A.B. last year was 118. For statistics, see UNIVERSITIES AND COLLEGES.

VAUGHAN, General ALFRED J., a Confederate veteran, died at Indianapolis, Ind., October 1, 1899. Born in Dinwiddie County, Va., May 10, 1830, he was graduated at the Virginia Military Institute in 1851 and entered the profession of civil engineering. He surveyed the route of the Hannibal and St. Joseph Railroad and later became United States surveyor for the district of California. At the outbreak of the Civil War he entered the Confederate service as a captain in the Thirteenth Tennessee Volunteers, which was one of the regiments in Cheatham's division. During the war he rose to the rank of major-general. Among the engagements in which he took part were those at Columbus, Ky., Dalton, Ga., Peach Tree Creek, and Chickamauga. In his various battles eight horses were killed under him, he was wounded repeatedly, and at Chickamauga lost a leg. After the war he was active in the work of the National Grange; he organized the State granges of Arkansas, Tennessee, and Mississippi, and in the last-named State was for a time master of the State Grange. In 1873 he removed from Mississippi to Memphis, Tenn., and from 1878 to 1886 was clerk of the criminal court in Shelby County. At the time of his death he was State commander of the United Confederate Veterans for Tennessee.

VENEZUELA, a republic of South America, is bounded on the north by the Caribbean Sea, on the east by British Guiana and Brazil, on the south by Brazil and Colombia, and on the west by Colombia. The capital is Caracas.

Area and Population.—The country consists of eight states, a federal district, and eight territories, the combined area of which was placed by the estimate of 1891 at 593,943 square miles. Of the Yuruari territory (area 81,123) more than one-half, and of the Delta territory (area 25,347) about one-third have been claimed by Great Britain as part of British Guiana. For an account of the settlement of this claim, see section on Boundary Arbitration. According to the census of 1891, the population was 2,323,527; the Indian population was about 326,000, three-fourths of whom were called civilized. The area of the federal district is 45 square miles and the population over 89,000. Of the states Miranda has the most inhabitants, 484,509, and Carabobo has the densest population, about 61 a square mile. Bolivar is the largest state, 88,701 square miles, and is the most sparsely inhabited, 0.6 a square mile. The largest territory is Alto Orinoco, 119,780 square miles. The total territorial population, excepting that of Goajira, numbers only about 75,000; Goajira comprises 3608 square miles and has 65,990 inhabitants. Recent municipal statistics are not available; the last reported figures, however, give the following town populations: Caracas, 72,429; Valencia, 38,654; Maracaibo, 34,284; Barquisimeto, 31,476; Barcelona, 12,785; Ciudad de Cura, 12,198; Ciudad Bolivar, 11,686; Guanare, 10,880. For several years official encouragement has been given to immigration, but has not met with large success. Immigration and emigration are about equal. In July, 1899, was announced the enactment of a law looking to a constitutional amendment for re-establishing the political divisions that constituted the Venezuelan union in 1864. The purpose is to revive the states of Apure, Aragua, Barcelona, Barinas, Barquisimeto, Carabobo, Cojedes, Coro, Cumaná, Guárico, Guayana, Maracaibo, Margarita, Maturín, Mérida, Portuguesa, Táchira, Trujillo, Yaracuy, and Zulia.

Government.—The chief executive authority is vested in a president, who is elected for a term of two years, and is assisted by a federal council of nineteen members and a cabinet of six members. The federal council is chosen by the congress every second year, and neither its members nor the president are eligible for the succeeding term. The president is General Cipriano Castro. The legislative power rests with a congress of two houses, the senate and the house of representatives; members of the former are twenty-four in number, three for each state, and are elected by their respective legislatures for terms of four years; representatives serve for the same length of time and are chosen by popular vote at a nominal ratio of one for each 35,000 inhabitants. The number of representatives reported, however, is only 52. Territorial administration is controlled by the federal government, but the states are granted considerable independence. They have their own executive, legislative, and judicial officers and manage their own finances. There are various inferior courts, the supreme court of appeal, and the supreme federal court.

Army and Navy.—The regular army in 1898 consisted of ten battalions numbering about 3600 men. Citizens from their eighteenth to their forty-fifth year are liable to service in the national militia; this at times has reached the number of 60,000 men.

Venezuela's naval power is barely better than nothing. There are reported a few small river gunboats, two sailing vessels, and three steamers.

Finance.—The chief source of revenue is import duties, which for the fiscal year 1898-99 were estimated at 24,838,000 bolivars; for the same year the largest item of expenditure was for governmental administration, estimated at 16,736,200 bolivars. The revenue and expenditure in bolivars for fiscal years ending on the 30th of June have been:

	1896-97	1897-98	1898-99
Revenue.....	48,313,540	Estimated...40,150,000	Estimated...34,542,000
Expenditure....	103,904,780	Estimated...40,150,000	Estimated...34,542,000

The total external debt in 1897 amounted to \$22,324,925, United States currency. Interests on parts of this, due in February and July, 1898, were not paid. At the beginning of 1898 the outstanding internal debt was 131,292,120 bolivars.

Venezuela adopted the gold monetary standard in 1896; at this time the currency consisted of about 12,000,000 bolivars in gold and 8,000,000 bolivars in silver. The value of the bolivar in United States currency is fixed at \$0.193. In commercial language the word "peso" is frequently used; there is, however, no such coin in Venezuela, and the word signifies four bolivars. The Venezuelan dollar is a coin of five bolivars in value.

Industries.—The country is naturally adapted for agriculture and cattle-raising, while the mineral resources are very considerable. Manufacturing industries not only have not been developed, but have scarcely been introduced. About one-fifth of the inhabitants are engaged in agriculture, and the principal crop is coffee. Venezuela, in fact, ranks second among the coffee-producing countries of the world. The area under coffee cultivation is estimated at from 180,000 to 200,000 acres, and the estimated product for 1898 was about 116,400,000 pounds. Sugar and cacao are also important products, while in the untilled districts, or the "forest zone," the inhabitants take the products of the wild rubber trees, the copaifera, the cinchona trees, and the vanilla and tonga plants. Cattle-raising is already an important industry and will probably become one of the most lucrative in Venezuela. In 1895 the number of cattle was estimated to be between 4,000,000 and 5,000,000. The government has the management of the lands that are without lawful owners, and is empowered to dispose of them either to natives or immigrants. Agreements have been entered into whereby each of the members of immigrant families brought by the Italian Colonization Society may receive free 6 hectares (14.8 acres) of land.

Among the metals and minerals found in Venezuela are gold, silver, copper, iron, sulphur, asphalt, coal, tin, lead, salt, kaolin, and petroleum. Mining, however, is little developed, there being little done at present in the industry beyond the exploitation of gold, silver, and salt. Iron mines, however, are being worked along the Imataco and Santa Catalina Rivers, near their confluences with the Orinoco. Gold is taken chiefly in the Yuruari territory and silver in the states of Lara, Los Andes, and Bermudez; the gold sent from the Yuruari region in 1896 aggregated 60,674 ounces, and in 1897, 43,500 ounces.

The general financial condition of the country was bad in 1898, and the prospects for 1899 were no better. In the former year the coffee crop was large, but the price had depreciated about 50 per cent.; in 1899 a large part of the crop was destroyed by long-continued drought, while the price remained very low. Other causes of financial distress in 1899 were the revolutionary disturbances and the suspension of payments on the national bonds.

Commerce and Shipping.—The principal exports include coffee, cacao, rubber, hides and skins, Peruvian bark and other medicinal products, gold, and feathers. The leading imports are provisions, textiles, hardware, coal, machinery. In the fiscal year 1895-96 the exports amounted to 111,455,143 bolivars. For the next fiscal year the leading exports were: Coffee, from Maracaibo, Puerto Cabello, La Guaira, and Ciudad Bolivar, 44,667 tons; cacao, from the same ports, 4047 tons; rubber, 339 tons; hides and skins numbering 3,440,109; Peruvian bark, 68,439 pounds; gold in bars, 1352 kilogrammes. The total value in United States currency of the exports for the fiscal year 1897 was reported to be \$17,960,114; the reported value of the imports for the previous fiscal year was \$8,456,952. Venezuelan exports go chiefly to the United States, France, and Germany, though many cattle are shipped to the West Indies.

In 1898 the Venezuelan merchant marine comprised 11 steamers, with an aggregate net tonnage of 2185, and 17 sailing vessels, of 2760 tons. In 1897 there entered and cleared at La Guaira 312 vessels of 676,500 tons; at Maracaibo, 285 vessels of 78,620 tons; at Ciudad Bolivar, 133 vessels of 58,367 tons.

Communications.—Land transportation is difficult and lake and river routes are gaining in importance. In the early part of 1899 there were fourteen lines of railway in operation, aggregating 503 miles (810 kilometres), and 1000 miles were under con-

sideration. In 1895 the length of telegraph lines was 3882 miles and the telegraph offices numbered 113. In his message of February 27, 1899, President Andrade stated that during the previous year 1231 miles of telegraph wire had been strung, and that eight new lines were under construction. There were 214 post-offices in 1898.

Religion and Education.—Toleration in matters of faith prevails, but permission for formal and organized expression is granted only to Roman Catholicism, which is the state religion. In 1894 all Venezuelans were reported as Catholic except 5906 without profession, 3575 Protestant, and 411 Hebrew. Education is in a backward condition, notwithstanding the statement of President Andrade in the early part of 1899 that it was "in a flourishing state." Primary education is free and nominally compulsory. The latest available statistics (1891) place the number of primary schools at 1415 federal and 151 state, with about 100,000 pupils in attendance. There were also reported one school of arts and trades, 4 normal schools, and 9 "barrack" schools. The institutions for higher education have been reported as follows: 22 federal and 26 private colleges, 11 federal colleges for girls, schools for fine arts, music and technics, one naval school, and 2 universities; the teachers and students of these institutions numbered 436 and 4882 respectively.

HISTORY.

Revolutionary Movements.—A revolt broke out in February, 1899, in the state of Guárico under General Ramon Guerra, but it did not extend beyond the limits of that state. The insurgents were defeated early in the following month, and before the close of March it was reported that the insurrection had been suppressed. A far more important event was the revolution under General Cipriano Castro, who took advantage of the discontent caused by an unconstitutional measure which had been passed at the instigation of President Ignacio Andrade and soon organized a formidable force. He defeated the government troops on August 23. President Andrade now took command of the government troops in person, and the revolt became so serious that in September the United States cruiser *Detroit* appeared in Venezuelan waters for the protection of American interests. The government troops suffered another serious reverse on September 15, and from that time on the success of the revolutionists was continuous. At the close of September Castro established a provisional government at Valencia. On October 1 a brief truce was arranged through the efforts of the commanding officer of the *Detroit* and other foreign representatives, but the overthrow of the Andrade government was now certain. In the latter part of October General Castro entered Caracas and assumed control of the government as provisional president. Andrade fled and most of his followers were disbanded. A small part of them, however, still held out, and a revolutionary movement was attempted by General Hernandez, but before the close of the year the Castro government appeared to be securely established in control.

Boundary Arbitration.—Diplomatic relations between Great Britain and Venezuela, which had been broken off by reason of the boundary dispute, were restored on February 2, 1897, when an arbitration treaty was signed. For Venezuela, Chief Justice Fuller and Justice Brewer, of the United States Supreme Court, were appointed arbitrators, and for Great Britain Mr. Justice Collins and Baron Herschell. Upon the latter's death, March 1, 1899, he was succeeded by Lord Russell of Killowen. Professor Martens, of St. Petersburg, was the fifth member and president of the tribunal. The arbitrators met in Paris in June, 1899, and on the 15th of the month Attorney-General Sir Richard Webster opened the case for Great Britain, and spoke thereafter twelve times. The case for Venezuela was first presented on July 21 by Mr. Severo Malet-Provost. The other speakers in order were as follows: Mr. Soley, for Venezuela; Sir Robert Reid and Mr. G. R. Askwith, for Great Britain; ex-Secretary Benjamin F. Tracy, for Venezuela; Sir Richard Webster, who made the final speech for Great Britain, and ex-President Benjamin Harrison, who closed the case for Venezuela. The dispute involved about 60,000 square miles, and, according to the award, which was made unanimously on October 3, 1899, all but a few hundred square miles of this territory was granted to Great Britain. Hence the decision, though a compromise, was very gratifying to the British. It brought to an end a dispute that had lasted over fifty years. The country thus definitely acquired by Great Britain contains a number of valuable gold fields. The disputed territory extended from the Essequibo River, on the east, nearly to the Caroni and Orinoco Rivers on the west, and from the Atlantic south to the Brazilian frontier. The Essequibo River marked the extreme claim of Venezuela, while the extreme claim of Great Britain was a line beginning at Punta Barima, at the mouth of the Orinoco, "running thence southwest and west, nearly parallel with and from 40 to 60 miles from the Orinoco to Upata; thence southward through the valley of the Caroni and close to that river, and southeast of Mount Roraima and the Brazilian frontier." The claims of Venezuela were based on those of Spain, to whose rights she succeeded upon gaining independence in 1821. The British claims were based on those

of the Netherlands, which country ceded the Guiana territory to Great Britain in 1814. In 1839 Sir Robert Schomburgk surveyed for Great Britain a line which the latter government did not consider as a limit to which it was rightfully entitled, but merely as a reasonable compromise. This famous Schomburgk line "wanders" southward from the mouth of the Barima River to Mount Roraima; it follows no natural boundary lines, such as rivers or mountains. This line, however, Venezuela refused to accept, and subsequent negotiations amounted to nothing. In 1881 a line known as the modified Schomburgk line and including somewhat more territory than the original one was drawn, and this in 1890 Great Britain declared to represent her minimum demand. The dispute threatened to become very grave when in 1894 and 1895 Venezuelan troops made demonstrations against British officials at Uruan, in the Cuyuni district, and when soon after the United States made a warning protest against what was considered a policy of unjustifiable aggrandizement on the part of Great Britain. An investigating commission was appointed by President Cleveland, but before the close of its sessions the arbitration treaty of February 2, 1897, had been signed.

The boundary established by the arbitration commission almost coincides with the old Schomburgk line. The new line, however, follows a number of rivers instead of going direct across open country. In Volume II. of the *Proceedings of the Arbitration Between the Governments of Her British Majesty and the United States of Venezuela*, it is defined as follows:

"Starting from the coast at Point Playa the line of boundary shall run in a straight line to the River Barima at its junction with the River Mururuma, and thence along the midstream of the latter river to its source, and from that point to the junction of the River Halowa with the Amakuru, and thence along the midstream of the Amakuru to its source in the Imataka Ridge, and thence in a southwesterly direction along the highest ridge of the spur of the Imataka Mountains to the highest point of the main range of such Imataka Mountains opposite to the source of the Barima, and thence along the summit of the main ridge in a southeasterly direction of the Imataka Mountains to the source of the Acarabisi to the Cuyuni, and thence along the northern bank of the River Cuyuni westward to its junction with the Wenamu, and thence following the midstream of the Wenamu to its westernmost source, and thence in a direct line to the summit of Mount Roraima, and from Mount Roraima to the source of the Cotinga, and along the midstream of that river to its junction with the Takutu, and thence along the midstream of the Takutu to its source, thence in a straight line to the westernmost point of the Akarai Mountains, and thence along the ridge of the Akarai Mountains to the source of the Corentin, called the Cutari River."

VENTILATION. See MINING ENGINEERING (paragraph Ventilation).

VENUS, ATMOSPHERE OF. See PHYSICS.

VERMONT, a New England State, has an area of 9565 square miles. The capital is Montpelier.

Mineralogy.—During the calendar year 1898 the State made a gratifying advance in the value of its quarry products, marble only showing a decline and that but slight. The values were: Granite, \$1,094,218; slate, \$732,684; marble, \$2,067,938, and limestone, \$174,150—total, \$4,058,990, enabling the State to retain its rank as the second producer. In granite it held the first place, with the largest output in its history. Copper-mining showed renewed activity in old fields that were once an important source of supply, and yielded 5,395,226 pounds, the highest production in any year of local record. In 1899 there was a greatly increased interest in both copper and gold. A diamond rock-drilling machine was put up in the Springfield mine in Windsor County to determine the real value of the property, where so far operations have been confined to the croppings. As the shafts are sunk deeper the dirt becomes richer. An assay in November showed that in one ton of dirt, from which the sample was taken, there were: Gold, \$9.51; silver, \$44.40, and lead, \$10.68—total, \$64.59. It is believed that there are many other veins of ore in the Green Mountains that will pay even better. Professor Richardson, of Dartmouth College, made a number of assays of ore showing gold, silver, and lead to the value of about \$25 per ton, and this is thought to be an average valuation.

Manufactures.—Vermont and Maine are included in the internal revenue district of New Hampshire, and the details of their taxable manufactures are combined with those of that State. In the year ending June 30, 1899, the collections of internal revenue in Vermont alone amounted to \$196,213. There were 6 manufacturers of tobacco and 38 of cigars, and in the calendar year 1898 the aggregate production was 1,865,056 cigars and a small quantity of smoking tobacco.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Memphremagog and Vermont aggregated in value \$4,376,420; exports, \$10,025,878, an increase in a year of \$289,384 in imports, and \$1,983,449 in ex-

ports. The movement in gold and silver was, imports, \$1000; exports, \$6764, making the total foreign trade of the year \$14,410,062.

Banks.—On October 31, 1899, there were 49 national banks in operation and 19 in liquidation. The active capital aggregated \$6,860,000; circulation, \$3,860,757; deposits, \$11,341,020, and reserve, \$4,022,966. There were also June 30, 1899, 40 mutual savings banks, with depositors, 113,369; deposits, \$36,526,750, and resources, \$39,369,732.

Railways.—The new railway construction in the calendar year 1898 was 2 miles, and in 1899, 14.50 miles, giving the State a total mileage of 1001.86.

Education.—At the close of the school year 1897-98, the school population was 90,388; enrolment in the public schools, 65,532, and average daily attendance, 48,000. There were 2786 teachers, 1891 buildings used as school-houses, and public school property valued at \$1,800,000. The revenue was \$901,689; expenditure, \$933,424, of which \$620,910 was for teachers' salaries. There were 55 public high schools, with 141 secondary teachers, 3156 secondary students, and 961 elementary pupils; 23 private secondary schools, with 117 teachers, 2076 secondary students, and 890 elementary pupils, and 3 public normal schools, with 19 teachers and 273 students in all departments. Normal training was also given in one college and 17 public high schools. Three universities and colleges for men and for both sexes reported 188 scholarships, 81 professors and instructors, 745 students, 88,268 volumes in the libraries valued at \$112,500, \$105,000 invested in scientific apparatus, \$725,000 in grounds and buildings, and \$755,000 in productive funds, \$104,489 in total income, and \$34,640 in benefactions. In 1899 there were 78 periodicals, of which 9 were dailies, 55 weeklies, and 10 monthlies.

Finances.—The assessed valuations for 1899 were: Real estate, \$117,642,114; personal property, \$57,969,558—total, \$175,611,672, an increase of \$848,039; tax rate, \$2 per \$1000. The total debt, July 1, 1899, was \$666,237, and the State had resources amounting to \$879,248, making an excess of assets over liabilities of \$213,011. More than one-half of the total debt was a floating one.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 337,000.

Legislation.—A State bacteriological laboratory was established; also a board of prison commissioners, to investigate applications for pardon and report to the governor. The governor was authorized to appoint a State highway commission, and a board of normal school commissioners, the latter to take charge of normal and training schools. County courts may hereafter render judgment and enter decrees in vacation if the case was heard during term. Laws were passed protecting game and fish, and prohibiting the desecration of the flag of the United States. Street cars must be equipped with fenders and guards. Provision was made for travelling expenses, medical attendance, and pay of soldiers and sailors. Railroads connecting at the State line may own, construct, and maintain terminal and connecting facilities. Mileage books of 1000 miles must be sold by railroads at two cents per mile and may be used by bearer.

State Officers and National Representatives.—Governor, Edward C. Smith; lieutenant governor, Henry C. Bates; secretary of State, Frederick A. Howland; treasurer, John L. Bacon; auditor, Orion M. Barber; adjutant-general, T. S. Peck; superintendent of education, Mason S. Stone. Supreme Court: Chief justice, Russell S. Taft; assistant justices, Loveland Munson, John W. Rowell, John H. Watson, H. R. Start, L. H. Thompson, James M. Tyler; clerk, M. E. Smilie. The State legislature consists of 233 Republicans, 41 Democrats, 1 Prohibitionist, and 1 Independent. Senators, Redfield Proctor, from Proctor; and Jonathan Ross, from St. Johnsbury—both Republicans. Representatives: H. Henry Powers, from Morrisville; and William W. Grout, from Barton—both Republicans.

VICTORIA, the smallest of the British colonies in Australia, occupies the south-eastern corner of the continent, and has an area of 87,884 square miles, with a coast-line of about 700 miles. Its population is estimated at about 1,179,000, including about 9000 Chinese and 560 natives. The last named are gradually diminishing in numbers. The capital, Melbourne, is the largest city in Australia, and has a population of 458,610. It contains the University of Melbourne, the mint, and a museum, public library, observatory, public gardens, hospital, and many churches, being also an Episcopal see. Other large cities are Ballarat, population about 46,000; Sandhurst, 43,000, and Geelong, 25,000. The density of the population is comparatively great, and over 655,780, or nearly five-ninths, of the inhabitants of Victoria live in towns. There is a considerable number of manufactories, about 2800 being the estimate for 1898. The products chiefly exported are the staples gold and wool, and in addition wheat and butter; less important exports are live stock, skins and hides, and preserved and frozen meats. In agriculture the total area cultivated in 1898-99 was 3,877,922 acres, over half of which, or 2,154,163 acres, was given over to wheat, the production of which was over 14,000,000 bushels; oats had an acreage of 266,159.

with about 16.35 bushels to the acre. The live stock includes principally sheep, which numbered, according to the latest estimates obtainable, over 13,000,000. In 1897 nearly 26,000 dairy farms were in operation, with nearly 400,000 milch cows, producing over 34,000,000 pounds of butter. The greater part of the trade is with Great Britain and the Australasian colonies; in imports, the United States and Germany are the first foreign countries, followed by India, China, France, and Belgium; in exports France, Germany, and the United States lead among foreign countries, followed by India, Belgium, and China. The total imports for 1898 were £16,768,904. The exports were £15,872,246, the principal items being as follows: Wool, £4,036,968; gold (including specie), £5,921,775; butter, £736,325; wheat (including flour and biscuit), £502,461; leather, £301,145; skins and hides, £373,054; live stock, £259,950. The magnitude of the trade is shown by the shipping entries and clearances for 1898, which aggregated over 4000 vessels, with a tonnage of nearly 5,000,000. There is a tariff on imported goods, amounting to about 12 per cent. While the exports to the United States show a decrease in 1897-99, due to the bad wool season, the imports have increased. United States Consular Reports during 1899 stated that there is a renewed growth in American-Australian trade, with every prospect of a continuation of such conditions. The exports to the United States are almost entirely wool, and this, together with agriculture, has been affected by the prolonged drought which has affected eastern Australia. (See NEW SOUTH WALES.) The revenue for the year 1898-99 was £7,378,842, and the expenditure £7,027,415. The outstanding public debt on June 30, 1898, was £47,058,088, of which the largest part was incurred in the construction of the railways, all of which now belong to the government. Of these, there were 3129 miles completed at the beginning of 1899, at a capital cost of £38,593,205; of this amount £2,803,740 were paid from the general revenue, and the remainder raised by loans. There were in 1898 about 14,730 miles of telegraph and 11,425 miles of telephone lines. The government of Victoria consists of a governor, appointed by the crown, and of a parliament, which has a legislative council of 48 members and a legislative assembly of 95 members. The governor and commander-in-chief in 1899 was Lord Brassey, and the premier and treasurer, Sir George Turner.

History, 1899.—One of the most important political acts of the year was the passage of the Federal Enabling bill, giving the assent of Victoria to the proposed federation of the Australian colonies, for a full account of which see the article AUSTRALIAN FEDERATION. By a vote of the assembly in October a contingent of Australian troops was offered to the imperial government for service in South Africa. At a later date they were transferred to the seat of war. In the council a bill for woman suffrage was defeated by a large majority. In December the ministry, having been defeated by a majority of 4 votes, resigned, and a new cabinet was formed under the Hon. Allan McLean. This was due to the withdrawal of those who had supported the government only during the movement for federation, and who were now re-enforced in their opposition by former friends of the government who had not been in favor of federation. A similar change of government took place in the other Australasian colonies which voted for federation.

VIRGINIA, a Southern Atlantic State of the United States, has an area of 42,450 square miles. The capital is Richmond.

Mineralogy.—During the calendar year 1898 the production of coal from 20 mines was 1,815,274 short tons, valued at \$1,070,417, an increase of 286,972 short tons in the year. Iron-mining yielded 557,713 long tons, valued at \$1,226,290, a decrease of 153,415 long tons. The ore was nearly all brown hematite, in the output of which the State held first place. In manganese there was a product of 5662 long tons, having a local value of \$9.88 per ton. Gold yielded 218 fine ounces, valued at \$4500, and gypsum, 8378 short tons, valued, when commercially prepared, at \$23,388. The quarry output was: granite, \$136,180; slate, \$150,946, and limestone, \$182,852—total, \$469,978.

Manufactures.—In 1898 six coking plants, with 1564 ovens, used 852,972 short tons of coal, and produced 531,161 short tons of coke, valued at \$699,781, an increase of 177,094 short tons. The production of pig-iron was 283,274 long tons, and of all kinds of rolled iron and steel, 34,497 long tons. In the fiscal year ending June 30, 1899, collection of internal revenue on taxable manufactures aggregated \$4,818,191. There were 126 manufactories of tobacco and 197 of cigars, and the combined output in the calendar year 1898 was 149,220,737 cigars, 22,048,362 pounds of plug tobacco, 21,385 pounds of fine cut, 4,826,332 pounds of smoking, and 711,098 pounds of snuff. Grain and fruit distilleries in operation numbered 630; the production of fruit brandy was 40,474 gallons; amount of spirits rectified, 919,342 gallons; distilled spirits gauged, 2,007,070 gallons, and fermented liquors produced, 137,079 barrels.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise at the ports of Alexandria, Newport News (1,066,727), Norfolk and Portsmouth,

Petersburg, and Richmond, aggregated in value \$1,336,389; exports at Newport News (\$28,177,817), and Norfolk and Portsmouth (\$13,831,233), \$42,009,050, making the total foreign trade of the year \$43,345,439, a net decrease in a year of \$2,243,505, chiefly in exports.

Banks.—On October 31, 1899, there were 36 national banks in operation and 20 in liquidation. The active capital aggregated \$4,641,000; circulation, \$2,554,646; deposits, \$20,716,533, and reserve, \$5,166,709. The State banks, June 30, 1899, numbered 89, and had capital, \$5,840,080; deposits, \$21,106,621, and resources, \$31,190,713. The exchanges at the United States clearing houses at Norfolk and Richmond, in the year ending September 30, 1899, aggregated \$221,434,718, an increase of \$47,853,254 in a year.

Transportation.—The new railway construction in the calendar year 1898 was 66.15 miles, and in 1899, 55.60 miles, giving the State a total mileage of 3730.13. On October 14, 1899, the famous Dismal Swamp Canal, extending from Deep Creek, near Norfolk, to Pasquotank River in North Carolina, a distance of 22 miles, was formally reopened to navigation, after having been abandoned for more than a century. The waterway was originally surveyed by George Washington, and its reconstruction cost nearly \$1,000,000. It is 10 feet deep and 80 feet wide, and has a lock at each end. Any vessel drawing less than 10 feet of water can now avoid the dangers of Cape Hatteras by taking this inside route.

Education.—The last official reports of the common schools available at the time of writing were for the school year 1896-97, when the school population was 665,865; enrolment, 367,817; daily attendance, 213,421. At the close of the school year 1897-98 there were 66 public high schools, with 166 secondary teachers, 3911 secondary students, and 2769 elementary pupils; 80 private secondary schools, with 278 teachers, 3146 secondary students, and 3122 elementary pupils; 3 public normal schools, with 105 teachers and 1578 students in all departments; and 6 private ones, with 53 teachers and 756 students. Normal training was also given in 5 colleges and 11 public high schools. Ten universities and colleges for men and for both sexes reported 9 fellowships, 107 scholarships, 131 professors and instructors, 1909 students, 160,425 volumes in the libraries valued at \$173,700, \$95,200 invested in scientific apparatus, \$2,159,000 in grounds and buildings, and \$1,779,000 in productive funds. \$273,769 in total income, and \$155,381 in benefactions. Thirteen colleges for women reported 12 scholarships; 182 professors and instructors, 1714 students, 11,195 volumes in the libraries, \$902,000 invested in grounds and buildings, and \$102,000 in productive funds, and \$177,086 in total income. Two schools of technology reported 45 professors and instructors, 555 students, \$77,000 invested in scientific apparatus, \$420,000 in grounds and buildings, and \$365,312 in productive funds, and \$118,785 in total income. In 1899 there were 258 periodicals, of which 29 were dailies, 177 weeklies, and 39 monthlies.

Finances.—The assessed valuations for 1898 were: Real estate, \$308,761,367; personal property, \$100,046,014—total, \$408,807,381, an increase of \$3,582,556 in a year and the highest total yet reached. The total debt, September 1, 1899, was \$24,331,477, consisting of bonds issued to the bondholders' committee, \$16,359,860; bonds deposited with sinking fund commissioners, \$1,645,420; Riddleberger bonds, \$6,329,554—total, \$24,334,834, less bonds cancelled, \$3357. On September 19 the debt in the hands of individuals was further reduced by \$114,000 in "century" bonds, purchased for retirement by the sinking fund commissioners.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 1,780,000.

State Officers and National Representatives.—Governor, J. Hoge Tyler; lieutenant-governor, Edward Echols; secretary of state, Joseph T. Lawless; first auditor, Morton Mayre; second auditor, Josiah Ryland, Jr.; treasurer, A. W. Harman, Jr.; superintendent of free schools, J. W. Southall; attorney general, A. J. Montague. Supreme Court of Appeals: President, James Keith; justices, John W. Riely, John A. Buchanan, George M. Harrison, Richard H. Cardwell; clerk, G. K. Taylor. The State legislature consists of 131 Democrats and 9 Independents and Republicans. Senators: Thomas S. Martin, from Scottsville, and John W. Daniel, from Lynchburg—both Democrats. Representatives: William A. Jones, from Warsaw; William A. Young, from Norfolk; John Lamb, from Richmond; Sydney P. Epes, from Blackstone; Claude A. Swanson, from Chatham; Peter J. Otey, from Lynchburg; James Hay, from Madison; John F. Rixey, from Brandy; William H. Rhea, from Bristol, and Julian M. Quarles, from Staunton—all Democrats.

VIRGIN ISLANDS, a West Indian archipelago, lying to the east of Puerto Rico, comprise about 35 islands, with a total area of 176 square miles and a population upward of 40,000. St. Croix, St. Thomas, and St. John, having a combined area of 118 square miles, belong to Denmark (see DANISH WEST INDIES). The remaining islands, the more important of which are Tortola, Virgin Gorda, and Anegada, are owned by Great Britain and form a presidency of the colony of the Leeward Islands.

(*q. v.*). The capital is Roadtown (population, 1891, 403), on the south side of Tortola. The following figures for the British presidency are for 1898: Exports, £3855; imports, £3943; revenue, £1715; expenditure, £1783. The aggregate entrances and clearances in foreign shipping in 1897 amounted to 11,545 tons.

VITALISM. See BIOLOGY.

VITAL STATISTICS. From the report of the health department of the city of New York for the quarter year ending June 30, 1899, are compiled the following figures. The subsequent reports were not available at time of writing. On that date the estimates of the population were, by boroughs: Manhattan, 1,953,569; the Bronx, 163,537; Brooklyn, 1,231,543; Queens, 134,139; Richmond, 67,260; total, 3,550,053. The death-rate for the three months was 18.16 per 1000; marriage-rate, 9.12; birth-rate, 20.07. Richmond appears to be the healthiest borough, with a death-rate of 15.17; Queens shows 17.09; Brooklyn, 17.45; Manhattan, 18.53; and the Bronx, 21.21. The last figures are explained by the number of deaths in institutions in the Bronx, transferred thither from Manhattan. Of the 16,119 deaths, 8742 occurred in tenements, and 3950 in institutions. There were 160 suicides during the quarter, 121 being males. Of these, 44 took carbolic acid, 32 inhaled gas, and 36 shot and 15 hanged themselves. Two deaths are reported of women who had passed the century mark: Eliza Stanwood, aged 100 years 11 months and 29 days, and Margaret Jackson, aged 102 years, both natives of the United States, and both residents of Brooklyn. The former died of "old age," and the latter from apoplexy, according to the certificates of the physicians.

From the annual bulletin of the New York board of health it is learned that the number of deaths in the State for 1899 was 121,320, an increase of 850 over the previous year, and of 4740 over 1897—a year of unusually low mortality. The average death-rate remains about the same, however, 17.3 per 1000. The mortality of infants was less than the average by about 5000, amounting to 29 per cent. of the deaths of persons under 5 years, against an average of 35 per cent. Diphtheria carried off about half the usual number. About 15 per cent. of the total deaths, or 18,000, were due to respiratory diseases, nearly 7000 having perished from la grippe (epidemic influenza) in the first four months of 1899.

The total number of deaths in Philadelphia during 1899 was 23,796, or about 18.78 per 1000. This, with the single exception of 1897, is the lowest ratio for twelve years. Of the whole number of persons who died in 1899, 4560 were under 1 year of age, 2496 between 1 and 5, and 5677 over 60 years. Of these, 145 died of membranous croup, 849 of diphtheria, 132 of scarlet fever, 948 of "scarlet rash," 146 of cerebro-spinal meningitis, 2818 of tuberculosis of the lungs, 2424 of inflammation of the lungs, 200 of epidemic influenza, 1482 of heart disease, 726 of cholera infantum, and 766 of "old age." There was an increase in the mortality from typhoid fever of 209 cases over last year as a result of the epidemic during the first three months of the year.

In the bulletin of the Chicago health department, issued November 30, 1899, are computed the mortality statistics for the eleven months of 1899. There was a joint epidemic of scarlet fever and diphtheria in November, and an increased mortality was feared for the closing month of the year. There had been 484 deaths from scarlet fever, against 67 in 1898, and 81 in 1897; 738 deaths from diphtheria, against 622 in 1898 and 702 in 1897. The excess of the city's death-rate for 1899 was 2545, or 12.03 per cent. The April, 1899, report of the Chicago health department shows that the average age at death of all who died in Chicago in 1899 was double the average age 30 years ago. It is calculated that the aggregate ages of those who died in 1898 reach a total of 672,540 years, "a gain of 324,735 years of life among the 22,897 persons who died in 1898."

The city of Denver, as a result of public improvements and reform in sanitary administration, shows a death-rate of 12.13 during the past 7 years, and of 11.18 during the past 4 years, as against 19.4 per 1000 during the six years from 1886-91. In a population of 160,000 this is calculated to mean a saving of 1315 lives per year.

The unprecedented death-rate of Dublin continues. During the first week in December, 1899, it reached 40.2 per 1000 of population, as against 27.4 in former years, and 17 to 18 per 1000 in the larger cities of England. Conferences of the medical officers of health in the city are frequent, but differences in religion or politics frustrate or delay every definite scheme for sanitary reform.

An erroneous opinion prevails regarding the mortality from disease of the American army at Santiago, and of the expedition in the Philippines. It is usually considered to be greater than that sustained by armies of other countries in tropical climates. Dr. E. H. Bradford published, in July, 1899, in the *Boston Medical and Surgical Journal* the following table. The statistics show an undue mortality of 2000 in the summer camps, in August and September, after the practical cessation of campaigning.

COMPARISON OF MONTHLY DEATH-RATES (PER 1000) FROM DISEASE.

1861-62.				1898-99.		
Months.	Mean Strength.	Number of Deaths.	Ratio per 1000 of M. S.	Ratio per 1000 of M. S.	Number of Deaths.	Mean Strength.
May.....	16,161	18	1.11	.96	42	163,728
June.....	66,960	55	.82	.44	90	202,526
July.....	71,126	106	1.49	1.73	451	203,613
August.....	112,859	242	2.15	5.21	1,400	205,507
September.....	165,126	365	2.21	5.69	1,541	201,594
October.....	256,864	725	2.83	3.17	909	255,000
November.....	301,848	1,145	3.79	1.51	865	242,000
December.....	343,184	1,471	4.29	.84	201	240,000
January.....	372,760	1,598	4.52	.85	180	211,000
February.....	327,784	1,346	4.11	.87	156	180,000
March.....	328,878	1,575	4.79	.90	123	126,000
April.....	410,416	1,551	4.58	.71	80	113,000
Annual.....	229,453	10,522	45.86	25.73	5,436	211,350

The following table was prepared by Dr. Mosher, of Boston, Mass., to show a statistical comparison of the Spanish war with other wars. The table shows the percentage of mortality in campaigns by the French, English, Americans, Germans and Japanese in tropical countries.

Deaths from Disease.		Deaths from Disease.	
Walcheren (E.), 1809.....	23.33	Cape Coast (E.), 1873.....	17.30
West Coast Africa (E.), 1894.....	69.00	Afghanistan (E.), 1878-80.....	9.37
Mexican (U. S.), 1846.....	10.00	Egypt (E.), 1882.....	7.21
Mexican (U. S.), 1848.....	10.00	Soudan (F.), 1883-86.....	28.00
Crimea (E.), 1854.....	22.00	Madagascar (F.), 1895.....	30.00
China (F.), 1863.....	11.80	Chino-Japanese (J.), 1895.....	1.48
Civil War (U. S.), 1862.....	4.00	Spanish-American (U. S.), 1898-99.....	2.50
Civil War (U. S.), 1863.....	6.00	Manila Expedition (U. S.), 1898.....	.80
Franco-Prussian (G.), 1870-71.....	1.43		

The subjoined table by Dr. Bradford shows the percentage of strength of the army that succumbed to disease:

TABLE OF MORTALITY FROM DISEASE IN CAMPAIGNS IN TROPICAL COUNTRIES.

British Army.		French Army.	
Name and Date of Campaign.	Died of Disease. Percentage of Strength.	Name and Date of Campaign.	Died of Disease. Percentage of Strength.
Soudan, 1889.....	0.06	Tonkin, 1884.....	6.0
Mashonaland, 1876-97.....	0.20	Tunis, 1881.....	6.1
Suakin, 1885.....	0.23	Mexico, 1892-93.....	7.1
Soudan, 1885-86.....	0.41	Tonkin, 1885.....	7.5
China (Talienwan), 1860.....	0.54	Dahomey, 1893.....	8.7
Ashanti, 1895-96.....	0.56	Tonkin, 1886.....	9.9
Egypt, 1882.....	0.57	Tonkin, 1887.....	10.6
*Manila Expedition, 1899, U. S. A.....	0.80	Cochin China, 1863.....	10.7
Abyssinia, 1867-68.....	1.21	Soudan, 1867-68.....	11.6
Galeika Gaika, 1877-78.....	1.40	Cochin China, 1862.....	11.7
China Field Force, 1860.....	1.49	China, 1863.....	11.8
Matabeleland, 1896.....	1.65	Tonkin, 1888.....	13.3
Ashanti, 1874.....	1.74	Cochin China.....	14.0
Zululand, 1879.....	2.48	Soudan, 1885-86.....	20.0
*Spanish-American, 1898-99, U. S. A.....	2.50	" 1886-87.....	22.0
Chitral, 1895.....	2.51	" 1884-85.....	22.5
Nile, 1884-85.....	3.64	" 1883-84.....	26.0
Dongola, 1896.....	4.66	Madagascar, 1895.....	30.3
Afghanistan, 1878-80.....	9.37		

* United States Army.

The English campaigns show figures partly better, partly worse, than those of the Manila campaign. Their mortality in one tropical campaign was as low as 0.06 per cent., says Bradford. In contrast with this the English mortality from disease in the Afghan war ran up to 9.37 per cent., and to-day, in time of peace in India, it averages from 4 per cent. to 6 per cent. Kitchener's troops in the Soudan campaign, mostly seasoned natives, with a small acclimated European contingent, were not comparable with our green troops, none of whom were acclimated. While the English had the same heat to bear, they did not have the tropical rains nor the yellow fever. Yet typhoid broke out among the English troops, and one battalion lost 16 per cent., an average fully equal to that of some of our green volunteer regiments on their return from Cuba, where they had the special disorders of malaria and yellow fever also to combat. Up to the writing of Dr. Bradford's paper, from which we quote largely, in the Manila expedition the losses from disease were 0.8 per cent. In 1824 the British lost from disease on the west coast of Africa 69 per cent. of their men. Inspection of the tables will show what a very small per cent. of our men died of disease in 1898, as compared with the number in 1862 and 1863. The losses from disease in the Santiago campaign were relatively small, and the losses in the Manila expedition will compare with the best. No quotations are made from the weekly *Public Health Reports* of the United States Marine Hospital Service to the treasury, as their disease tables and mortality tables are incomplete and at best only approximate. See DIPHTHERIA; EPILEPTIC COLONIES; INFLUENZA; PLAGUE; SCARLET FEVER; SMALLPOX; TUBERCULOSIS; TYPHOID FEVER; WATER SUPPLY AND TYPHOID FEVER; YELLOW FEVER.

VOGEL, Sir JULIUS, K.C.M.G., colonial statesman and writer, died March 13, 1899. He was born in London, February 24, 1835; was educated privately and at the London University School and the Government School of Mines. He emigrated to Melbourne in 1852, and after engaging in journalism went to New Zealand in 1861, and established the first daily paper in the colony—the *Otago Daily Times*. He entered politics, and in 1866-69 was the head of the provincial government. In the latter year he was colonial treasurer in the Fox ministry, and in 1870 became commissioner of customs, telegraph commissioner, and postmaster-general. On his way to England in 1871, by way of San Francisco, he established the present mail service between that city and New Zealand. The Fox ministry was defeated in 1872, but a vote of want of confidence in the new ministry being carried, Vogel was again called to the offices of postmaster-general and colonial treasurer. Becoming premier in 1873, he established the "public trustee" system and a system of government life insurance. After visiting England again he returned to New Zealand in 1876 and resumed his place as premier, but in the same year was sent to England as agent-general, in which position he remained until 1881, returning to the colony in 1884. He formed then with Sir Robert Stout a ministry, in which he was colonial treasurer and postmaster-general. He held the office until 1887, when he returned to England. While agent-general he succeeded in obtaining after much effort an act of Parliament in 1877, permitting an arrangement by him with the Bank of England for an inscription of colonial loans. The plan was similar to the one adopted with consols. Vogel received the title C.M.G. in 1872 and K.C.M.G. in 1875. Besides pamphlets and magazine articles, he published *A. D. 2000, or Woman's Destiny*.

VOULCANOES. Another eruption of Mauna Loa, one of the volcanoes of the Hawaiian Islands, occurred on the 4th of July, 1899. The lava flow came from the side of the mountain, about 3000 feet from the top, and near the source of the flow of 1880-81. The lava flowed from two vents, and the eruption was so violent that masses of lava and heated rock were not infrequently thrown to a height of nearly 200 feet. The two lava flows joined farther down the mountain and formed a main stream that was about a mile wide in its lower course and 12 to 15 miles long. The eruption was preceded by an earthquake on June 11, and the smoke from the eruption was encountered by a steamer on the 17th of July at a point 600 miles to the north-east of the island.

VOLUNTEERS OF AMERICA, formed by a secession in 1896 from the ranks of the Salvation Army (*q. v.*) under the leadership of Commander Ballington Booth, report for 1899 a great work in the prisons of the country. The number of prisoners reached by them is put at 10,500, and the influence and good works of the organization extend to them after they are discharged from prison. The Volunteers have 500 officers and 200 posts. The commander is Mr. Ballington Booth; headquarters, 1 Fourth Avenue, New York City.

WAGES. Official reports on wages for 1899 are not issued in time for their results to be included in the present article, and statistics for 1897 and 1898 are the only ones available at present from the publications of the various State bureaus of labor statistics. The report of the Indiana department of labor for 1897 and 1898 shows an increase in the number of persons employed and in the amount of wages

paid in the following industries: Agricultural implements and machinery, breweries, furniture, iron and steel products, paper and paper goods, planing mills, hog and cattle products, railway construction and ship-building, wagons, and carriages. The report of the Kansas bureau of labor and industrial statistics gave the returns received from 819 male wage-earners in various occupations. It was found that the average annual wage of 668 employees was \$443, and that the average cost of living of 452 was \$377. The great majority of those who reported were members of labor organizations, and nearly half were protected by insurance. A similar compilation of returns from 135 female wage-earners showed that their average working day was nine hours, and the average annual earnings of the majority were \$219. Only three of the number reported were members of labor organizations, and only 24 were insured. The report of the Maine bureau of labor and industrial statistics for 1898 contained a tabulated comparison of statistics of cotton and woollen mills for the years 1897 and 1898. This showed a slight decrease in the amount of wages paid and in the average weekly wages for the cotton mills, and an increase in the amount of wages paid in the woollen mills, but a slight decrease in the average weekly rate. The weekly wages of men in the cotton mills during the year 1898 averaged \$7.58; of women, \$5.60. In the woollen mills the weekly wages for men were \$7.97, and for women, \$5.98. The report of the labor bureau of Missouri for 1898 estimated the daily wage of employees from the returns of 863 private establishments. The daily wage rate for skilled labor averaged \$2.23 for men and \$1.31 for women, while the average for unskilled labor was \$1.21 for men and \$0.75 for women. Some wage statistics are included in the report of the secretary of internal affairs of Pennsylvania for the year 1897. This shows, on the basis of returns from 363 establishments representing 49 industries, that between 1892 and 1897 there was a considerable decrease in the average number of persons employed and in the aggregate amount of wages paid, but in both these items there was an increase in 1897 over 1896. The report of the labor bureau of West Virginia contains statistics of employment in 500 manufacturing establishments. These show a rapid expansion of industry during the year 1897. On January 1, 1898, there was an increase in the number of employees in all but one of the industries that reported. The report of the Connecticut bureau of labor gives statistics based on returns from 564 identical establishments. These show a great increase both in the number of persons employed and in the amount of wages paid during the year ending July 1, 1898, as compared with the preceding year.

The general purport of the statistics contained in these and other State reports is the same. The expansion of industry since 1896 is clearly traceable in the movement of wages which in the great majority of industries have increased. One of the most important reports published by State bureaus is that on the annual statistics of manufactures issued by the bureau of statistics of labor in Massachusetts. The last report on this subject shows that the wages paid in 80 industries had increased by 1.61 per cent. in 1898 over the previous year. The average annual rate of wages decreased by a small fraction; in 1897 it was \$422.26, and in 1898 \$421.48. The number of employees, however, increased from 326,778 to 332,669. The following table contained in this report compares the wages of men with those of women:

PER CENT OF MALES AND FEMALES OF THE WHOLE NUMBER EMPLOYED AT SPECIFIED WEEKLY WAGES IN 80 INDUSTRIES, 1897 AND 1898.

Weekly Wages.	1897.		1898.	
	Males.	Females.	Males.	Females.
Under \$5	38.90	61.10	38.00	61.40
\$5 or under \$6	37.44	62.56	39.33	60.67
\$6 or under \$7	47.73	52.27	46.33	53.67
\$7 or under \$8	57.53	42.47	56.21	43.79
\$8 or under \$9	64.98	35.02	67.32	32.68
\$9 or under \$10	81.47	18.53	83.35	16.65
\$10 or under \$12	86.83	13.17	86.09	13.91
\$12 or under \$15	94.01	5.99	93.30	6.70
\$15 or under \$20	97.41	2.59	97.05	2.95
\$20 or over	98.64	1.36	98.66	1.34
Total	66.40	33.60	66.31	33.69

WAIT, JOHN TURNER, M.A., LL.D., ex-congressman from Connecticut, died in Norwich, April 21, 1899. Mr. Wait was the oldest practising lawyer, and one of the best-known citizens in the State. He was born in New London, Conn., in 1811. With his parents he moved to Norwich in early life; was educated in the public schools,

at Bacon Academy, Colchester, and at Washington, now Trinity, College, Hartford. In 1836 he was admitted to the bar, and began practice in Norwich. In 1864 the Republican State Convention nominated him by acclamation, as a war Democrat, to be the first elector on the Lincoln and Johnson ticket. During 1865 and 1866 he served as State senator, and in 1867, 1871, and 1873 was a member of the lower House of the legislature, serving in the first-named year as speaker. In 1876 he filled a vacancy in the Forty-fourth Congress, and subsequently was five times elected to the position; having served eleven years, he declined further renomination.

WAKEMAN, HENRY OFFLEY, fellow and bursar of All Souls' College, Oxford, died April 29, 1899. He was born in September, 1852; was educated at Eton and at Christ Church, Oxford; became a barrister, and taught in Keble College. He was a member of the Oxford Hebdomadal Council. He wrote: *Life of Charles James Fox*; *The Church and the Puritans*; *An Introduction to the History of the Church of England*.

WALDECK-ROUSSEAU, PIERRE MARIE, premier of the French republic, was born in Rennes, December 2, 1846. He entered the profession of the law, and in 1879 was elected to the chamber of deputies. When Gambetta formed his ministry in 1881 he intrusted to Waldeck-Rousseau the portfolio of the interior; the latter, however, held office only to January 26 of the following year. In February, 1883, in the cabinet of Jules Ferry he was given the same position, which he held until March, 1885. He then retired from politics, but on October 7, 1894, was by a large majority elected to the French senate from the department of Loire. After the resignation of the presidency by M. Casimir-Périer in January, 1895, M. Waldeck-Rousseau received for the office of president 184 votes on the first ballot, but then withdrew from the contest in favor of Felix Faure. On June 12, 1899, the cabinet of M. Charles Dupuy resigned. French politics were in a turbulent condition, and the task of organizing a new cabinet was difficult. Several unsuccessful attempts were made to form a ministry before M. Waldeck-Rousseau accepted the premiership (June 22). The new ministry represented most diverse elements, comprising on the one hand General De Gal-lifet, distinguished for his vigor in suppressing the Commune, and on the other M. Millerand, the socialist leader. See FRANCE.

WALFISCH BAY, a British possession on the southwest coast of Africa, is cut off from the interior by German territory. The area is 430 square miles and the population (1891), 768. It was acquired by Great Britain in 1878, and made a dependency of Cape Colony. Some years later the protectorate of Southwest Africa was acquired by Germany, but Great Britain retained possession of Walfisch Bay, which, therefore, divides the coast-line of the German territory and excludes from it its chief harbor. There has been considerable discussion as to the value of this possession to Great Britain, on account of its relative position to and its encroachment on the German protectorate. It has been proposed that it be transferred to Germany in return for concessions elsewhere; for instance, that, if possible, a strip of territory be obtained in German East Africa between the head of Lake Tanganyika and British East Africa. A glance at the map of Africa will show that British territory extends continuously from the Cape to the Mediterranean, a distance of 5000 miles, excepting for the strip mentioned above, which is only about 200 miles long, and Lake Tanganyika, 400 miles long, which is, however, open to navigation for the ships of all countries bordering upon it. Whether Germany would be willing to give this immense advantage to Great Britain is another question.

WALLACE, HILL, C.B., British major-general, retired, died June 5, 1899. Born at Alicante, August 13, 1823, and educated at private schools and Addiscombe College, he entered the Bombay Artillery in 1843. He was subsequently transferred to various regiments, but almost his entire service in the army was with the artillery. He became a lieutenant-colonel in 1863, and the following year assistant adjutant-general in the Bombay army. For his services in the Abyssinia expedition, in which he commanded a division of the Royal Artillery, he was decorated, and for his part in the capture of Magdala he was mentioned in the despatches, was awarded a medal, and was created a C.B. His last command was in Mysore, from 1875 to 1879, when he retired.

WALLACE, ROBERT, M.A., D.D., member of Parliament, was born at St. Andrews, Scotland, June 24, 1831; died June 6, 1899. He was educated at the universities of St. Andrews and Edinburgh, and became parish minister at Newton-upon-Ayr in 1857; three years later he became minister of Trinity College Church, Edinburgh, and in 1868 was called to Old Greyfriars in the same city. He accepted the chair of church history in the University of Edinburgh in 1872. From 1876 to 1880 he was the editor of the *Scotsman*, and in 1883 became a barrister-at-law. From 1886 to the time of his death he represented East Edinburgh in Parliament, as a Liberal. Dr. Wallace wrote *Church Tendencies in Scotland*, the article *Church*

History in the *Encyclopædia Britannica*, and numerous essays on politics and economics which have appeared in well-known periodicals, including the *Fortnightly Review*, *Nineteenth Century*, and *Saturday Review*.

WALLER, Mrs. EMMA, a once famous actress and teacher of elocution, died in New York, February 28, 1899, at the age of seventy years. She was born in England; in 1848 she married in London a well-known American actor, Daniel Wilmarth Waller, who died in 1882. Mrs. Waller first acted in this country in 1851. Her husband was stage manager at Booth's Theatre, New York, from 1869 to 1873; during this time and a few years before she was at the height of her fame, being regarded by many as a tragic actress of the first rank. Her manner resembled that of Charlotte Cushman, but she never equalled the latter's artistic perfection. She was associated with many prominent actors, including Edwin Booth. Among her rôles which in a quarter of a century have not been forgotten were Meg Merrilies and Katharine of Aragon.

WALSH, PATRICK, ex-United States senator from Georgia, died in Augusta, March 19, 1899; he was born in Ballingary, County Limerick, Ireland, January 1, 1840. At an early age he came to Charleston, S. C., where by self-exertion he was educated and entered upon journalistic work. He removed to Augusta in 1862, and the following year became editor of the *Augusta Constitutionalist*. In 1866 he was appointed southern agent of the New York Associated Press, and in 1867 became business manager of the *Chronicle and Sentinel*, which ten years later united with the *Constitutionalist*. Mr. Walsh was prominent in the Democratic party of the State, and from 1872 to 1878 represented Richmond County in the legislature. He was a delegate to the national Democratic convention of 1880, and delegate-at-large to that of 1884. In 1894 Governor Northern appointed him to fill the vacancy in the United States Senate caused by the death of Alfred H. Colquitt. In 1897 he was elected mayor of Augusta, for three years. Mr. Walsh was prominent in the work of the Roman Catholic Church and was actively interested in the advancement of the South.

WAR OF 1812, **GENERAL SOCIETY OF THE**, is composed of federated State societies, the first of which was founded in New York in 1826 by veterans of the war. The membership of the society now consists of lineal descendants of soldiers and sailors of the War of 1812. It had in 1899 nine State societies and over 700 members. Next general biennial congress at Philadelphia, June 19, 1900. President-general, John Cadwalader; secretary-general, Captain Henry Hobart Bellas, U. S. A., 421 South Forty-fourth Street, Philadelphia, Pa.

WARBURTON, Colonel Sir ROBERT, C.S.I., died April 22, 1899, at the age of fifty-six. He entered the British army in 1861, and served brilliantly in the Abyssinian War of 1867-68, and in the Afghan War of 1879-80. He was promoted to the rank of colonel in 1893, and was created a K.C.I.E. in 1898.

WARREN, Lieutenant-General Sir CHARLES, the son of the late Major-General Sir Charles Warren, was born in Bangor, North Wales, February 7, 1840. After receiving his education at Cheltenham, Sandhurst, and Woolwich, he entered the Royal Engineers in 1857, and became captain in 1869, major and lieutenant-colonel in 1878, and colonel in 1882. In 1876-77 he was a boundary commissioner in Griqualand, and served in the Kaffir War in 1878, and Griqua and Bechuana campaigns of 1882. In 1884-85 he led with success the Bechuanaland expedition. Having returned to England, he was chief commissioner of the Metropolitan police in 1886-88. In 1889 he was appointed to command the troops in the Straits Settlements with the temporary rank of major-general; and, returning to England in 1894, he was appointed to the command of the troops in the Thames district. In November, 1899, General Warren took command of the Fifth Infantry Division assigned for service in South Africa. He has also performed efficient work for the Palestine Exploration Fund, having conducted a series of excavations in 1867-70 in Palestine, principally around the walls of the Temple of Jerusalem. He is the author of *Underground Jerusalem* (London, 1876); *The Temple or the Tomb*, 1880; and *Jerusalem*, 1884.

WASH-HOUSES, **MUNICIPAL**. See MUNICIPAL BATHS AND WASH-HOUSES.

WASHINGTON, a Pacific coast State, has an area of 69,180 square miles. The capital is Olympia. Washington was admitted to the Union, November 11, 1889.

Mineralogy.—During the calendar year 1898 the State again surpassed all its previous records as a coal producer, with an output from 23 mines of 1,884,571 short tons, valued at \$3,352,798, an increase in a year of 450,459 tons. Of the total output King County yielded 785,806 tons, Kittitas, 566,396, and Pierce, 509,142. Of the precious metals, gold yielded 37,065 fine ounces, valued at \$766,200, and silver 254,400 fine ounces, coining value, \$328,981. The official estimates for 1899 were, gold, \$806,202; silver, \$452,525. Quarrying showed increased activity, with productions of granite valued at \$9700; sandstone, \$15,575; marble, \$3600, and limestone.

\$140,239—total, \$169,114. The year 1899 was the busiest and the most satisfactory in the mining history of the State. More mines were opened, more money expended in working them, and the output was larger than ever before. In gold, silver, copper, and lead the production aggregated in value \$2,500,000, more than double that of the previous year, and the greatly enlarged operations gave a conservative promise of another doubling in values in 1900. Among the most noteworthy events of the year were the discovery of sodium sulphate deposits in Okanogan County, near the river of the same name, which bids fair to result in the establishment of a glass-making plant at Seattle; the discovery of anthracite coal in Whatcom County, 40 miles from tidewater, and of several large silver-lead and gold-copper ledges in the same vicinity; an extensive copper strike on Palmer Mountain; an unusually large strike of ore on the 600-level of the Republic mine, in consequence of which the company, which was reported to have sold the property to Canadian capitalists for \$3,000,000, determined to erect a 200-ton mill for the treatment of the ore; and the uncovering of a great deposit of tellurium in the State Creek district. More than 5000 men were employed in the coal mines, and all were working night and day with an equipment of the best machinery. Preparations were completed for working the great copper ore belt near Index, in the western part of the State, during 1900 to the fullest extent of capital and experience.

Manufactures.—Washington and Alaska are included in the internal revenue district of Oregon, and the details of their taxable manufactures are combined with those of that State. In the year ending June 30, 1899, the collections of revenue in Washington alone aggregated \$637,245. The principal tobacco manufactures were cigars, the combined output of 105 factories being 4,759,115. Washington has the only coking plants on the Pacific coast. In 1898 one with 30 ovens went out of business, leaving 2 with 90 ovens, which used 48,559 short tons of coal, and produced 30,197 short tons of coke, valued at \$128,933, an increase of about 4000 tons in the year and the largest production yet reached. At the close of the season of 1898, the value of the salmon fishery plants in the Puget Sound region was estimated at \$1,769,980; number of men employed, 3516; cases of salmon packed, 400,200. Of these totals Washington was credited with investment, \$865,680; persons employed, 1775, and cases packed, 111,525. The State fish commissioner reported that while the Columbia River fisheries, as a whole, did not show a material decrease in output from that of 1897, the Washington side of the river had proven a great disappointment. The sturgeon fishery alone had declined till in 1898 it was not 10 per cent. of what it was in 1892. See OREGON.

Commerce.—In the fiscal year ending June 30, 1899, the imports of merchandise in the Puget Sound district aggregated in value \$7,239,718; exports, \$15,200,320, an increase of \$2,181,629 in imports, and a decrease of \$2,718,672 in exports. The movement of gold and silver was, imports, \$3,139,654; exports, \$87,845, a decrease in both. The total foreign trade of the year was \$25,667,537, a net decrease in a year of \$2,556,787.

Railways.—The new railway construction in the calendar year 1898 was 14.23 miles, and in 1899, 75 miles, giving the State a total mileage of 2884.85. The Great Northern Railroad had surveyors out in November, 1899, running lines for a branch from Index to Galena, 15 miles along the north fork of the Snohomish River, for the benefit of the troublesome mining district. Transportation facilities were further increased in 1899 by the federal government, which, by improving the navigation of the Okanogan River, opened up a large mineral section that has heretofore been almost inaccessible for nine months in the year. Railway property was assessed for taxation in 1899 at \$20,500,983.

Banks.—On October 31, 1899, there were 31 national banks in operation, and 46 in liquidation. The active capital aggregated \$3,360,000; circulation, \$1,017,197; deposits, \$19,005,351, and reserve, \$8,310,118. The State banks, May 31, 1899, numbered 28, and had capital, \$1,602,800; deposits, \$5,558,044, and resources, \$7,650,044. The exchanges at the United States clearing houses at Tacoma, Seattle, and Spokane in the year ending September 30, 1899, aggregated \$201,083,408, a net increase of \$51,722,780 in a year.

Education.—At the close of the school year 1897-98, the school population was 118,491; enrolment in the public schools, 97,916, and average daily attendance, 64,192. There were 3321 teachers, 1941 buildings used as school-houses, and public school property valued at \$4,977,679. The revenue was \$2,094,775; expenditure, \$1,795,795, of which \$1,081,008 was for teachers' salaries. There were 36 public high schools, with 101 secondary teachers, 2630 secondary students, and 431 elementary pupils; 12 private secondary schools, with 52 teachers, 419 secondary students, and 763 elementary pupils; and 2 public normal schools, with 15 teachers and 403 students in all departments. Normal training was also given in 5 colleges and 2 public high schools. Nine universities and colleges for men and for both sexes reported 8 scholarships, 106 professors and instructors, 1102 students, 27,146 volumes

in the libraries, \$45,000 invested in libraries, \$23,958 in scientific apparatus, \$644,000 in grounds and buildings, and \$150,000 in productive funds, \$111,688 in total income, and \$32,250 in benefactions. In 1899 there were 224 periodicals, of which 15 were dailies, 176 weeklies, and 27 monthlies.

Finances.—The equalized assessed valuations for 1899 were: Real estate, \$172,129,311; personal property, \$36,507,245, and railway property, \$20,500,983—total, \$229,137,539; tax rate, \$6.65 per \$1000. The total bonded debt, exclusive of bonds for \$390,000 issued for investment of the State school fund, was \$220,000; floating debt, \$1,472,983. All State bonds are subject to call at any time.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 475,000.

Legislation.—To encourage the cultivation of beets, a bounty is placed upon sugar made from them. A State hop inspector was to be appointed. A State dairy commissioner, having large powers, was also to be appointed; skimmed milk and cheese made from it must be labelled in large letters; milk cans must be marked showing capacity, and all milkmen in cities must be licensed. It was made unlawful to destroy or remove fixtures, buildings or permanent improvements on mortgaged real estate. The office of State game warden was created. A pure food bill was passed. The State board of pharmacy is to examine and license all druggists. A horseshoers' board of examiners is required to examine, register, and license all horseshoers in cities, as is done in Minnesota, Maryland, New York, Colorado, and Illinois. It is now a misdemeanor to black-list an employee, and eight hours was made a day's work on public works. An elaborate mining law, similar to that of Colorado, was passed; the State board of pardons was abolished. Attendance at school was made compulsory in cities of over 10,000 inhabitants.

State Officers and National Representatives.—Governor, John R. Rogers; lieutenant-governor, Thurston Daniels; secretary of State, W. D. Jenkins; treasurer, C. W. Young; auditor, Neal Cheatham; attorney-general, P. H. Winston; adjutant-general, E. H. Fox; superintendent of education, F. J. Browne. Supreme Court: Chief justice, M. J. Gordon; associate justices, R. O. Dunbar, M. A. Fullerton, T. J. Anders, J. B. Reavis; clerk, C. S. Reinhart. The State legislature consists of 83 Republicans, 28 Populists, and 1 Citizen. Senators, George Turner (Pop.), from Spokane; and Addison G. Foster (Rep.), from Tacoma. Representatives, Francis W. Cushman, from Tacoma; and William L. Jones, from North Yakima—both Republicans.

WATER, DRINKING. See HYGIENE.

WATER POWER. See WATER-WORKS.

WATER PURIFICATION. During 1899 the 15,000,000-gallon water-purification plant at Albany, N. Y., was completed and put in operation. The water is first settled in a large reservoir, then filtered through beds of sand, covered with groined arches of concrete. During the last four months of 1899 this plant treated 1,470,000,000 gallons (net) of water from the Hudson River, at an average cost of \$4.19 per 1,000,000 gallons, including all operating expenses, but no capital charges. The cost of lifting the water from the river to the filters accounted for \$2.52 of the \$4.19 per unit. For the four months, the works removed an average of 99.1 per cent. of the bacteria found in the river water. The typhoid deaths for the same period numbered only 7, against 24 during the corresponding months of the previous year. The cost of the whole plant, including the pumping station and a large steel pipe line 8000 feet long, was about \$500,000, or some \$30,000 per 1,000,000 gallons of capacity. The filters proper cost some \$255,000.

At Lawrence, Mass., where a slow-sand filter plant, without a covering, was put in operation in 1893, there has been a reduction in the number of deaths from typhoid fever from about 12 to 1.39 per 10,000 population, the latter rate being for 1898. Up to October 1, 1898, the Lawrence City filter removed 99.24 per cent. of the bacteria in the applied water, and for the whole year the removal was 97 per cent., the falling off being due to disturbances caused by reconstructing a part of the filter in the latter part of the year. It appears that this filter would give better results if it were covered, there being so much ice on the bed in winter that machinery has been installed for hauling it up the embankment and dumping it into the river.

Several mechanical filter plants were tested during 1899, to determine whether they were capable of fulfilling the guarantees of their contractors. A filter at East Providence, R. I., having a capacity of 500,000 gallons a day, was run for over a month at the rate of 125,000,000 gallons an acre, with the use of a coagulant at the rate of one grain of sulphate of alumina per gallon of water, and showed a removal of 99.24 per cent. of bacteria. The color of the water was reduced by 83 per cent. With lower amounts of the coagulant the work of the filter for a longer period showed a removal of 98.87 per cent. of bacteria. A similar filter at Norfolk, Va., but with a capacity of 6,000,000 gallons a day, showed good bacterial results during a 30 days' test, and a

very satisfactory removal of color, the plant having been installed largely for the latter purpose. Still another mechanical filter plant, of a somewhat different type, was tested at Louisiana, Mo., for six days. It removed an average of 97.3 per cent. of the bacteria, the highest per cent. remaining in the purified water being 72. The water is taken from the Mississippi River, and is liable to be very muddy, or heavy with suspended matters. During the test coagulants were used at the rate of 2.5 grains of sulphate of alumina and 1.25 grains of lime per gallon of water. This type of filter makes use of compressed air to agitate the sand during washing, instead of the revolving rake employed at the East Providence, Norfolk, and many other plants. The Louisiana filter is also supplemented by sedimentation tanks giving a normal subsidence of $3\frac{1}{4}$ hours.

At Kansas City and Carthage, Mo., sulphate of alumina has been used recently in connection with sedimentation reservoirs. Experiments with ozone as a method of treating water to get rid of bacteria have recently been made in this country and abroad, but the process has not been put on a practical basis, and seems likely to be costly, although otherwise efficient, providing the water is comparatively free from suspended matters. Experiments with slow-sand and mechanical filtration were begun on Potomac River water at Washington in 1899, and during the same year Philadelphia voted some \$12,000,000 for water purification works, which it is understood will be chiefly slow-sand filters. Pittsburg also voted \$2,500,000 in 1899 for water purification, and the introduction of meters to suppress waste. Settling-reservoirs and slow-sand filters will probably be built in Pittsburg. Numerous other places installed either mechanical or slow-sand filters in 1899, a plant of the latter sort, with a vaulted masonry roof, having been constructed at Superior, Wis., to remove iron from ground water.

WATER, SPECIFIC HEAT OF. See PHYSICS.

WATER-SUPPLY and TYPHOID FEVER. Interesting statistics have been compiled and published by Dr. A. C. Abbott, chief of the department of bacteriology of the Philadelphia board of health, and professor of hygiene in the University of Pennsylvania, relative to the condition of the water-supply as bearing on the frequency of typhoid fever. His figures are, in brief, as follows:

"Pure mountain springs: Munich and Vienna, 4.0 deaths [from typhoid] per 100,000 inhabitants. Properly filtered water: Hague, Berlin, London, Rotterdam, and Edinburgh, 8.3 per 100,000 inhabitants. Ground-waters, springs, wells: Frankfurt, Dresden, and Paris, 14.7 per 100,000 inhabitants. Impounded surface springs: Brooklyn, New York, Boston, and New Haven, 23.1. Normal rivers, pollution eliminated through the agency of time, dilution, sedimentation, etc.: Trenton, Montreal, Omaha, New Orleans, St. Louis, and Minnesota, 28.5. Large lakes subject to pollution: Toronto, Milwaukee, Detroit, 30.3. Upland streams and small lakes, water-sheds inhabited: Denver, San Francisco, Reading, Providence, 42. Rivers and wells known to be polluted: Philadelphia, Atlanta, Cincinnati, Albany, Jersey City, Pittsburg, Camden, and Washington, 60.8 per 1000 inhabitants."

WATER-WORKS. The new tunnel system at Chicago, twelve miles in aggregate length, begun in 1896, was practically completed during 1899. It connects a crib in the lake, nearly three miles from the shore, with three pumping stations, one at the shore and two some distance inland, the land sections being in the form of the letter Y. The whole of the lake section and the stem of the Y, four miles in all, is 10 feet in diameter; each of the branches is also about four miles long, but only 8 feet in diameter. The intake is a crib located in about 30 feet of water, and the centre line of the lake tunnel is 89 feet below the lake level. The crib is composed of timber work, steel plates and concrete, being 112 feet in diameter at the lake bottom and having a central well 60 feet in diameter. The crib is surmounted by a masonry superstructure and light-house tower. The former houses the crib-keepers. A steam-heating and electric-lighting plant is provided, there being a number of incandescent and two 150-candle-power arc lamps. One of the latter is in the light-house and the other is in the well. The tunnel is lined with brick throughout, either four or three rings in thickness. The tunnel was driven through a variety of material, including both hard and soft clay, and nearly two miles of solid rock, the latter in one of the 8-foot branches. Compressed air was used only for a part of the work. A system of electrical power was installed in March, 1897, to move material excavated at the heading. A 10-horse-power locomotive was used, which could haul eight cars each of 1 cubic yard capacity at the rate of six miles an hour. Besides connecting with the old Chicago Avenue pumping station, near the shore line, the land tunnels supply two new pumping stations, one at the end of each branch. Eventually there will be four 20,000,000-gallon vertical pumping engines at each of the new stations, but only three at each have been provided, the contracts for these having been let to Mr. Henry R. Worthington in 1897. The chief engineer for the tunnel system has been Mr. John Ericson, city engineer of Chicago.

The completion of the abandoned aqueduct tunnel at Washington, D. C., was resumed by the United States government in 1898 and is still in progress. The tunnel was begun in 1883 and abandoned some five years later, after the bore had been completed and partially lined. Faulty construction was the cause of abandonment, and a report adverse to its completion was largely responsible for its remaining idle for ten years. The tunnel is 20,715 feet long, and at an average depth of 150 feet below the surface. It is designed to connect the old aqueduct with a new reservoir in the city. It was driven through rock and was originally designed to have a cross-sectional area of 76.34 square feet where lined and 82.5 square feet where unlined. All of it will now be lined. The defective work consisted chiefly in improper lining and in voids back of the lining, which should have been filled with masonry. Acetylene gas is being used to light the tunnel. The work is being done under the direction of Lieutenant-Colonel A. M. Miller, U.S.A.

A large water-power pumping plant to supply water to Paterson and Passaic, and a number of other municipalities in New Jersey, was put in operation in 1899. It is located on and takes water from the Passaic River, at Little Falls, N. J. It is the property of the East Jersey Water Company, a syndicate which has been working systematically and persistently to control as large a portion as possible of the available water-supply sources of northeastern New Jersey. In 1892 this company completed large storage reservoirs on the headwaters of the Pequannock River, one of the branches of the Passaic, and constructed a steel pipe line 48 inches in diameter and 21 miles long, to deliver water into one of the reservoirs of the city of Newark; also a branch pipe line, 36 inches in diameter and five miles long, for the same city; steel plates $\frac{3}{4}$ to $\frac{1}{4}$ inch thick were bent to shape and riveted together to form these conduits. Later, the company paralleled the 48-inch line with one of the same size for its upper $5\frac{1}{2}$ miles and 42 inches in diameter for the lower $15\frac{1}{2}$ miles; it also constructed a third reservoir, thus providing a total storage capacity of over 9,000,000,000 gallons. These works were built under contract with the city of Newark for a gravity supply of 50,000,000 gallons of water a day. The contract price was \$6,000,000, but the city retained one-third of this sum for eight years, in return for which it allowed the company to sell 22,500,000 gallons a day to other municipalities until September 24, 1900. The largest consumer of this surplus has been Jersey City, which has been supplied from the Pequannock source since 1896, through a 42-inch steel pipe line, 10,000 feet long, connecting with the old works. Another large branch pipe line from this source provides for the supply of Bayonne, N. J. Since the whole yield of the Pequannock will go to Newark after 1900, the East Jersey Water Company built also the large pumping station at Little Falls, for the purpose of supplying Jersey City (temporarily), Bayonne, and other contract consumers after that date, and also to give better water to Paterson and Passaic. The station is located at the lowest point on the river from which anything like a safe supply can be drawn, the river below being little less than an open sewer. Above Little Falls the Passaic has a drainage area of 772 square miles. Allowing for the water already diverted for Newark, and that to be diverted for the permanent supply of Jersey City (see below), it is estimated that the Passaic at Little Falls can be made to yield 300,000,000 gallons of water a day, for power and supply, if ample storage is provided. The available head for power at the new works will range from 35 to 38 feet. The development consists of a supply canal or head-race about 60 feet wide, 1400 feet long and 8 feet in (water) depth, carrying about 1500 cubic feet per second; necessary gate-houses, one 3-foot and three 12-foot steel penstocks, two 66-inch and one 48-inch main to supply the pumps, the power and pump-house, and various accessories. The initial pumping-plant comprises three 10,000,000-gallon high and one 20,000,000-gallon low-pressure cross-compound duplex pumps, with the necessary turbines, and a 2500-horse-power steam plant. Both the steam engines and the turbines are direct-connected to the pumps, so that either or both may be used, as desired. The pumps, turbines, and engines were designed by Professor A. Riedler, of Berlin, Germany, but have been modified in some particulars here. Clemens Herschel, of New York, is chief engineer of the East Jersey Water Company.

During the year work was begun by Patrick H. Flynn, a Brooklyn contractor, on a permanent water development for Jersey City, capable of supplying 50,000,000 gallons a day by gravity and of being extended to a capacity of 70,000,000 gallons a day. The supply will be taken from the Rockaway River (a tributary of the Passaic), near Boonton, N. J., where a big dam and reservoir are being constructed. From the reservoir a 76-inch steel pipe line will extend for many miles to one of the existing reservoirs, delivering under a pressure equivalent to a head of 210 feet. The city may buy the works at \$7,395,000 for a 50,000,000-gallon plant or \$8,850,000 for a 70,000,000-gallon plant, with advances of about \$500,000 in each case if it waits 5, 10, or 15 years, instead of purchasing at completion. In case the works are not bought the city will pay for the water used as follows: For the first 25,000,000 gal-

lons a day, \$36 a million; for successive 5,000,000 gallons in addition at the rate of \$34, \$32, and \$24, respectively; for from 45,000,000 to 50,000,000 gallons a day, \$20.

During the severe winter months of 1898-99 many water-works in the West used electricity to thaw frozen water service and main pipes, making use of information supplied largely by a circular furnished by the University of Wisconsin, the system having been perfected by Professors Dugald Jackson and R. W. Wood, of the university. For service pipes up to 1½ inches in diameter a current of 200 to 300 amperes and 50 volts is recommended. A circuit is made so that current from electric lighting or other wires will pass through the frozen pipe, a transformer, with resistance, ampere-meter and fuse boxes being provided.

Electrolysis continues to give anxiety to water-works officials and others responsible for gas and water pipes. No better remedy has been suggested than proper bonding of the rails of electric railways, or else the double trolley system, so that the current will return direct to the power-house, instead of through gas and water mains. A few cities and water companies have taken legal measures to collect damages from street railway companies on this score. An interesting review of the subject, summarizing special reports from various cities, was presented at the last meeting of the Central States Water-Works Association, by F. A. W. Davis, of Indianapolis, Ind.

Lead-poisoning from lead water service-pipes became a subject of prominence in 1899, principally on account of trouble of this sort at Lowell, Mass. Exhaustive investigations of the subject are reported in the 1898 report of the Massachusetts State board of health, where the results of observations and experiments on many water supplies of the State are given in detail. The two active agents causing water to take lead into solution are held to be oxygen and carbonic acid. The trouble thus far experienced has been caused wholly by ground water supplies. Besides Lowell, Milford, Kingston, and Fairhaven, Mass., had many cases. The amount of lead water must take up to become dangerous cannot be stated in definite and universal terms, but the report states, "it is known that the continuous use of water containing quantities of lead as small as 0.05 parts per 100,000, or about 1-33 grain per gallon, has caused serious injury to health." The moral of all this is that lead service-pipes should not be used to convey water for human consumption unless it is known that the water will not materially attack the lead, which is a question for experts to decide for each water-supply. See DAMS; FIRE PROTECTION; WATER PURIFICATION.

WATER-WORKS ASSOCIATION, AMERICAN, organized in 1880, for the improvement of water-works construction and administration, had in 1899 a membership of 500. The twentieth annual convention is to be held in Richmond, Va., May 15-18, 1900. President, R. M. Clayton; secretary, Peter Milne, 14 John Street, New York City.

WATSON, Baron, WILLIAM WATSON, LL.D., a life peer, died September 14, 1899. Born in 1828, and educated privately and at the universities of Glasgow and Edinburgh, he was admitted to the bar in Scotland in 1851. From 1874 to 1876 he was solicitor-general for Scotland, and in 1875-76 dean of the faculty of advocates; from the latter year to 1880 he was lord advocate, and during the same period sat in Parliament, as a Conservative for the universities of Aberdeen and Glasgow. In 1880 he became lord of appeal in ordinary, retaining the position to the time of his death.

WATTERSON, Rt. Rev. JOHN AMBROSE, Roman Catholic bishop of Columbus, O., was born at Blairsville, Penn., May 27, 1844; died in Columbus, April 17, 1899. He was graduated in 1865 at Mount St. Mary's College, Emmitsburg, Md., in which institution, upon his ordination to the priesthood three years later, he became a professor, and in 1877 was made its president. He was consecrated bishop in 1880.

WAUCHOPE, ANDREW G., C.B., C.M.G., major-general in the British army, was killed in the battle of Magersfontein, near Kimberley, December 11, 1899. Having entered the army in 1865, he served in the Ashanti War in 1873, the Egyptian War in 1882, and the Soudan expedition in 1884. In that year and in 1885 he took part in the Nile expedition. As a brigadier-general in 1898 he was in command of the first brigade in the Egyptian expeditionary force. Before the Boer war General Wauchope had received four wounds in action, three of which were severe.

WEBB, WILLIAM HENRY, retired shipbuilder, died at his home in New York, October 30, 1899. He was the son of Isaac Webb, a shipbuilder, and was born in New York, June 19, 1816. He was a pioneer in the construction of steam vessels of large burden, and became one of the best-known shipbuilders and one of the foremost authorities on marine architecture in the United States. He built over 150 large vessels; a few of these may be mentioned. The *United States*, launched in 1845, a vessel of 2500 tons, made an international reputation; she was sold to Russia

and converted into a sloop of war just before the Schleswig-Holstein War. A new model for navy vessels devised by Webb was refused by the United States, and later by the French government, but was accepted by Russia, for which country, upon this model he built in 1858 the *General Admiral*, a screw frigate of 7000 tons. During the Civil War Webb designed a number of men-of-war for the Union service, and built several vessels that were used in maintaining the Southern blockade. Probably his most important ship was the iron-clad ram *Dunderberg* (now the *Rochambeau*), which he built for the French government two or three years before the Franco-Prussian War. At the time of its launching this was said to represent the highest type of offensive and defensive naval architecture, and was long the fastest armored vessel afloat. Webb also built two frigates for the Italian government, and received from King Victor Emanuel the decoration of the order of Saints Maurice and Lazarus. After his retirement from the shipbuilding business in 1869, he entered upon several business ventures, including the organization of a guano company, real estate investments, and an interest in the Central American Transit Company, which ran a line of ships to Nicaragua. Three times Webb declined the nomination for mayor of New York, and for fourteen years he was president of the New York City Council of Municipal Reform. He founded and endowed Webb's Academy and Home for Shipbuilders at Fordham Heights, New York City, the purpose of the academy being to "furnish gratuitous education in the art, science, and profession of shipbuilding."

WEHNELT INTERRUPTER. See PHYSICS.

WEILL, ALEXANDRE, French publicist and novelist, died in Paris, April 19, 1899. He was born May 10, 1811, of Jewish parents. In 1838 he wrote with J. J. Louis Blanc for *La Revue du Progrès Politique*, and later took a position on the staff of *La Presse*, where his work chiefly concerned foreign politics. From *La Presse* he went to *La Gazette de la France*, in which, from the Legitimist point of view, he defended the constitutional monarchy. Besides his novels, the first of which appeared about 1856, he wrote many essays on art, on politics, and on religious subjects; these last he treated according to the critical method.

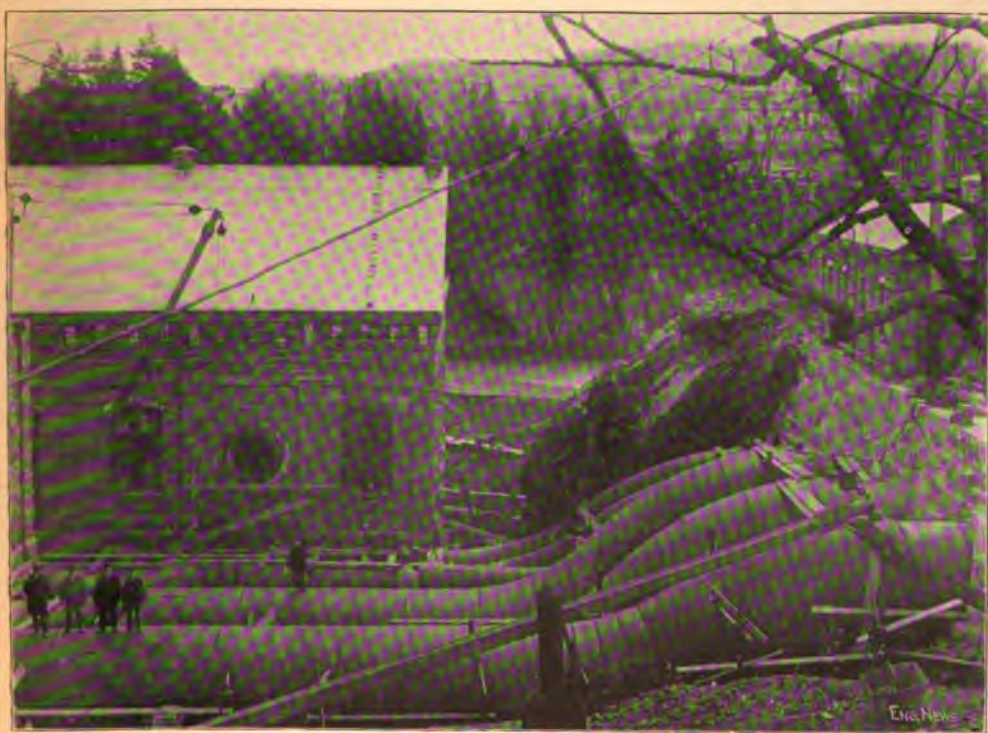
WELLESLEY COLLEGE, at Wellesley, Mass., was established in 1875 by private benevolence, and entered upon its work with a costly material equipment, but with no endowment in money. It has thirty scholarships for the benefit of approved candidates for the M.A. degree and thirty-five for undergraduates. The college is a contributor to the support of the American School of Classical Studies at Athens and the American School of Classical Studies at Rome, thus giving its graduates opportunities for study abroad. In 1899 the degree of M.A. was conferred upon two candidates, that of B.A. upon 131 candidates. For statistics see UNIVERSITIES AND COLLEGES.

WELLS, J. MADISON, ex-governor of Louisiana, died on his native plantation in Leconte, Rapides parish, February 28, 1899, in his ninety-second year. He is remembered for his prominence in the political disorders of Louisiana from 1865 to 1876. At the election ordered by President Lincoln in 1864 in that part of the State held by the Union forces, Wells was chosen lieutenant-governor; in the early part of the following year he succeeded to the governorship, and in 1867 was elected by the popular vote. Reporting on the New Orleans riots of 1866, General P. H. Sheridan accused the governor of want of vigilance and energy, and the next year an effort was made in the legislature to impeach him. In 1867 also there was trouble over the disbursement of \$4,000,000 appropriated for the improvement of the levees along the Mississippi; and General Sheridan, after advising Secretary of War Stanton that Wells was "a political trickster and a dishonest man," removed him from office, appointing in his place General Benjamin F. Flanders. Wells then entered the Republican party, and in 1876 was United States naval officer at the port of New Orleans; in this year, after the Hayes-Tilden campaign, he was made chairman of the Louisiana Returning Board, which board was believed by the opposite party to have thrown out a sufficient number of votes to insure the election of Hayes. For a number of years subsequently he held federal office, but was never again prominent in politics.

WELTI, ÉMILE, ex-president of the Swiss confederation, died in Berne, February 24, 1899. He was born at Zurzach, Canton Aargau, April 23, 1825. After studying law at Berlin and Jena he settled in 1847 as an advocate in his native canton. He was a volunteer in the secession (Sonderbund) war. In 1856 he became president of the district court of Zurzach, then a member of the legislative body of Aargau, and from 1857 to 1866 represented his canton in the state council (Ständerath), of which body he was president in 1860 and 1866. In December of the latter year he was elected president of the confederation, and was re-elected for the years 1869, 1873, 1876, 1880, 1884, and 1891. Aside from the years in which he was presi-



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WATER WORKS.—1. Twelve-foot Steel Penstock, New Water Power Pumping Plant of the East Jersey Water Co., Little Falls, N. J.
2. Head Race Beneath Morris Canal.

dent, Welti was connected with the military affairs, and had the rank of colonel. The military reorganization of 1874 was his work. Later he devoted himself to the post-office and railway departments, and succeeded in establishing more satisfactory freight tariffs on the railways. Later still he strove to bring about the nationalization of the railways, but the decisive step which he wished to take in this direction was denied him by the Swiss people in their rejection, in December, 1891, of the proposition to purchase the Central Railway. He thereupon retired to private life. Welti was the author of various articles on the history of law that appeared from time to time in the *Argovia* magazine.

WESLEYAN METHODIST CONNECTION OF AMERICA, in 1899 reported 23 conferences, 595 ministers, 506 churches, and 17,201 communicants, the last figure showing a gain of 700 over 1898. Much substantial progress was made during 1899, 3 new conferences having been organized in October. The body showed a strong revival spirit. The seminary at Houghton, N. Y., was raised to the grade of a college.

WESLEYAN UNIVERSITY, at Middletown, Conn., founded in 1831, is the oldest of the colleges established under the auspices of the Methodist Episcopal Church, although it is in no sense a sectarian institution. A large number of free scholarships, covering wholly or in part the charge for tuition are at the disposal of the president for the benefit of needy and worthy students. At the close of the college year in 1899 the number of students was greater than ever before, the faculty had been strengthened, the library had been added to and made more serviceable, important changes in the curriculum had been decided upon, and the facilities for athletic training had been multiplied, and made of more general advantage. A movement to raise \$150,000 for a new recitation and administration building was authorized. In order to reduce the expense of a college course, a college commons has been established where board may be obtained at a very low rate. Among the recent gifts to the university were a legacy of \$25,000 from the late John Humphrey Sessions, of Bristol, Conn.; \$38,000 from Miss Elizabeth J. Mead, of Stamford, subject, however, to an annuity during the life of the donor, and \$30,000 from the late Albert Sanford Hunt, D.D., class of 1850, the income of which is to be spent in the purchase of books. Dr. Hunt also left to the library his large and valuable collection of books and pamphlets. In June, 1899, a class of 64 was graduated. For statistics, see **UNIVERSITIES AND COLLEGES**.

WEST AFRICA is controlled almost wholly by the European powers, France, Great Britain, Portugal, Germany, Spain, and Belgium, the only states which are entirely independent being Morocco and Liberia. France is the leading power in western Africa, her territorial area aggregating over 3,000,000 square miles, with a population estimated at 27,000,000. Within this territory lies almost the entire length of the Senegal River, navigable for 500 miles, and the Niger, 2500 miles long, lies for nearly half its length within French Africa; French territory, also, extends along the northern bank of the Congo into the heart of the continent, where it meets the sources of the Nile. France has uninterrupted communication from Algeria and Tunis, opposite her home ports on the Mediterranean, through the Sahara and Soudan, Lake Tchad, and French Congo, to the Congo River in the fifth degree south latitude. Her coast-line is interrupted at intervals by Morocco, Spanish Rio de Oro, Portuguese Guinea, Liberia, German Togoland and Cameroon, and British Gambia, Sierra Leone, Gold Coast, Lagos, and the Niger coast and territories. All but the last named are, comparatively, of small extent. See the separate articles **ALGERIA**; **TUNIS**; **SENEGAL**; **FRENCH SOUDAN**; **FRENCH GUINEA**; **DAHOMY**, and **FRENCH CONGO**.

British possessions in Africa are very extensive, but they lie mostly in the southern and eastern sections. England's West African territory, which has been much increased within the last thirty years, includes Gambia, Sierra Leone, Lagos, Gold Coast, the Niger coast protectorate, and the Niger territories, descriptions of which are given under these titles. The last is a large and valuable tract, and contains the Niger River, which leads to the far interior.

Portugal controls two divisions of West Africa, the first being Portuguese Guinea, south of British Gambia, and the second Angola, south of the Congo state, with an area of nearly 500,000 square miles.

Germany first secured a foothold in Africa in 1884. On the western coast she has Togoland, Cameroon, and German Southwest Africa, and on the eastern coast German East Africa. See **EAST AFRICA**, **GERMAN**.

Spain retains only Rio de Oro, lying south of Morocco, with an area of about 243,000 square miles; the station of Ifni, and the islands of Fernando Po, Annabon, Corisco, Elobey, and San Juan.

Belgium has for some years administered, under international recognition, the Congo Free State.

WEST AFRICA, BRITISH. The possessions of European nations on the western coast of Africa grew out of the slave trade on the Guinea coast, and when that was suppressed early in the nineteenth century, the liquor trade continued to make these possessions worth holding. France, Germany, and Great Britain are the chief rivals and landholders of the west coast, and it is through the colonies of the latter power that the larger part of the trade with the United States is carried on. These British possessions at the present time include GAMBIA, SIERRA LEONE, the GOLD COAST; LAGOS; the NIGER COAST PROTECTORATE, and the NIGER TERRITORIES, which see for detailed descriptions.

WESTERN AUSTRALIA, occupying the western third of Australia, is the largest of the five British colonies which make up the continent. It has an area of 975,920 square miles, its greatest length north and south being nearly 1500 miles and its width about 1000 miles. The population of Western Australia was estimated in 1899 at 170,069; the capital, Perth, had about 43,000; the chief port, Fremantle, 15,000. It has a fine climate and one which extends over twenty degrees of latitude, insuring considerable diversity of conditions. Among natural products of value are the eucalyptus tree, especially the variety known as the jarrah, locally called mahogany, the karri, a tree of enormous size, and the tuart. In a different botanical class is the sandal-wood tree, whose timber has long been an export of the colony. It is estimated that there are over 20,000,000 acres of forest land in Western Australia; of this about 8,000,000 acres are jarrah forests, and 1,200,000 acres are covered by the karri. Besides timber, pearl and pearl shells contribute to the natural products, and gold, coal, lead, copper, iron, zinc, and tin. Western Australia has attained the leading position as a gold-producer in Australia, and is rapidly advancing toward the position of first world-producer of gold. Between 1886 and 1897 the output of gold increased from 302 ounces, valued at about £1147, to 674,993 ounces, valued at £2,564,976. In 1898 the output was 1,050,184 ounces, valued at £3,990,698. In 1899 it was officially estimated that the production would be fully £6,000,000. The gold reefs are said to be about 1200 miles long, the most famous field being the Coolgardie district. Valuable coal areas have recently been discovered, especially in the vicinity of Bunbury. The mining population has penetrated well into the interior, but the occupied portion of the colony is largely along the western coast, where the land is of considerable fertility. About 133,180 acres were under crop in 1897, but millions of acres are suitable for cultivation. Little dressing is required, and the rainfall being certain no crop failures such as have affected eastern Australia have ever occurred in this colony. About 20,000,000 acres of fairly good pasturage exist along the rivers of the north and northeast. The exports of 1898 were valued at £4,960,006, of which gold amounted to £3,990,698, wool, £287,731, and timber, £326,195, other exports being sandal-wood, pearls, and pearl shells, tin, copper, guano, and kangaroo-skins. The imports in 1898 were £5,241,965, the principal items being provisions, sugar, tea, tobacco, spirits, machinery, clothing, etc. Albany and Fremantle are the principal ports. The public revenue in 1898-99 was £2,478,811, and the expenditure £2,539,358. The public debt on June 30, 1899, was £10,488,363.

Western Australia is administered by a governor appointed by the crown, and a parliament consisting of a legislative council and assembly, containing respectively 24 and 44 members chosen by the people. In 1899 the governor was Sir Gerard Smith, and the premier and treasurer Sir John Forrest. It was the last of the Australian colonies to be granted a colonial government, the present constitution being framed by the imperial government in 1890. Education is compulsory, but not free. Aid is given to denominational schools. There are about 1360 miles of railroad, and 275 miles under construction. There are about 7000 miles of telegraph lines. There is a movement on foot to promote the construction of railways on a large scale on the land-grant system for the purpose of developing the interior of the country.

History, 1899.—The proposal for federation among the Australian colonies was defeated in Western Australia, that colony being the only one which decided to continue as a separate state. An offer was made to the imperial government of a contingent of troops for South Africa, and these left for the seat of war early in November amid considerable enthusiasm. Western Australia was the only colony in Australia whose government was not overthrown during the year.

WEST INDIES, a large number of islands and islets lying between the Florida coast and the coast of South America, or between 27° and 10° north latitude and 59° 30' and 85° west longitude, comprise the Bahamas, the Greater Antilles, the Lesser Antilles, which are divided into the Leeward and Windward islands, and various islands adjacent to the Central American and South American coasts. The total area is about 92,270 square miles and the aggregate population, about one-half of whom are negroes and the greater part of the remainder mulattoes, is estimated at about 5,000,000. The political division of the islands is as follows: *Independent:*

Haiti, comprising the republics of Haiti and San Domingo; *American* (U. S.): Cuba (provisional government) and Puerto Rico, Isla de Pinos, Culebra, Bieque, and other small islands; *British*: Jamaica, Turks, Caicos and Cayman islands, Antigua, Nevis, St. Christopher, Montserrat, the Virgin islands, St. Vincent, Grenada, St. Lucia, Barbados, Trinidad and Tobago, the Bahamas, and the islands adjacent to British Honduras; *French*: Martinique, Guadeloupe, Marie Galanta, St. Martin (in part Dutch), Les Saintes, Deseada, St. Bartholomew; *Danish*: St. Thomas, St. John, St. Croix; *Dutch*: Curaçao, St. Eustache, Saba, Bonaire, Aruba; *Venezuelan*: Tortuga, Margarita, Coche Cuagua. The areas and approximate populations of the West Indies belonging to European nations are as follows: British, area about 13,137 square miles, population 1,512,300; French, area 1068 square miles, population 357,000; Dutch, area 403 square miles, population 49,599; Danish, area 118 square miles, population 35,156.

Some of the more important statistics of West Indian finance and commerce have been:

	British.		Dutch.
	1806.	1897.	
Revenue.....	£1,869,570	£1,776,941	1898—Estimated, 683,000 guilders.
Expenditure...	1,920,088	1,881,044	1898—Estimated, 700,000 guilders.
Imports.....	6,440,463	5,867,687	1896—(Curaçao) 2,962,668 guilders.
Exports.....	5,252,053	5,094,160	
Foreign tonnage:			
Entered.. }	8,234,484	9,143,035	1896—526,148.
Cleared.. }			

Business depression in the West Indies during recent years caused the British government to empower a commission to investigate the matter to the end of bringing relief to the British possessions. The report of the commission was published in October, 1897, and by 1899 the recommendations had to a large extent been carried into effect. The general business depression was due chiefly to the serious falling off in the profits of the sugar industry. The best remedy is the abandonment of the bounty system, but this the commissioners found to be impracticable. The special measures of relief recommended by the commissioner and now being effected are: The settlement of laborers on small plots of land as peasant proprietors; the development of minor agricultural industries and the improvement of agricultural methods, especially with reference to small proprietors; the improvement of the means of communication, particularly between the different islands; the development of the fruit trade with New York and later, perhaps, with London; the establishment of central sugar factories in Barbados by means of an imperial loan of £120,000. Besides this sum the expenditure needed for these reforms was an immediate grant of £90,000 for the liquidation of the floating debt in some of the smaller islands, and for the settlement of laborers, and the construction of roads in St. Vincent and Dominica; and grants of £27,000 a year for ten years, and £20,000 a year for five years. Pursuant to a supplementary report measures were taken for the establishment of a West Indian department of economic botany, and for agricultural instruction, botanical stations to be established in the Leeward and Windward islands. It was thought in 1899 that the reorganization of industry thus undertaken, together with the natural resources of the islands, would effect a gradual return of prosperity.

On September 10, 1898, many of the islands, especially Barbados, St. Vincent, St. Lucia, and Trinidad, suffered much damage from a hurricane. On August 7 and 8, 1899, a terrific hurricane swept over the Lesser Antilles, Puerto Rico, and the Bahamas, touching also points in the island of Haiti and in eastern Cuba. Hundreds of persons in the smaller islands lost their lives, while in Puerto Rico the number of killed was reported to reach 2000. The amount of damage was incalculable, and in Puerto Rico about three-fourths of the population, it was said, were rendered homeless and destitute. The total loss of life in the West Indies was estimated at 5000. Relief measures for Puerto Rico were instituted at once by the United States government, and for the British islands by the imperial authorities. See AGRICULTURE (paragraph Agricultural Teaching).

WEST VIRGINIA, a central eastern State of the United States, with an area of 24,780 square miles. Capital, Charleston. West Virginia became a State on June 20, 1863.

Mineralogy.—During the calendar year 1898 the State increased its coal product over the output of 1897 by 2,452,840 short tons, and retained among the States its rank as the third producer, which it gained in 1896. The total production from 225 mines was 16,700,999 short tons, valued at \$10,131,264. In production, Fayette

County led, with 4,592,772 tons, followed by McDowell, 3,904,976; Marion, 2,114,352; and Kanawha, 1,354,500. Salt showed a decline, with 247,668 barrels of all kinds from four plants, valued at \$88,462; and quarrying yielded sandstone, \$14,381, and limestone, \$56,167. During 1899 the activity in all industries was unprecedented. Coal-mining suffered severely, because of a lack of miners. A number of well-paying mines were idle from scarcity of help, and in the Flat Top region alone fully 5000 more miners were needed. The chief mine inspector reported for the year ending June 30, 1899, a coal production of more than 18,000,000 tons, the employment of 25,000 men in and about the mines, and a steady increase in machine mining.

Manufactures.—During the calendar year 1898 the production of pig-iron was 192,699 long tons, and of all kinds of rolled iron and steel, 198,883 long tons. In the coking industry there were 87 plants, with 8659 ovens in operation, which used 3,145,398 short tons of coal, and produced 1,925,071 short tons of coke, valued at \$2,432,657. The yield of coke in the year ending June 30, 1899, was officially reported at more than 2,000,000 short tons. In the last period the collections of internal revenue on taxable manufactures aggregated \$1,430,106. There were 39 manufactories of tobacco and 148 of cigars, and the combined output in the calendar year 1898 was 72,470,252 cigars and 3,736,642 pounds of manufactured tobacco, principally smoking. The quantity of spirits rectified was 159,717 gallons; distilled spirits gauged, 702,326; and fermented liquors produced, 140,738 barrels.

Banks.—On October 31, 1899, there were 35 national banks in operation and 8 in liquidation. The active capital aggregated \$3,576,550; circulation, \$1,676,022; deposits, \$12,624,339; and reserve, \$4,254,980. The State banks, September 30, 1899, numbered 75, and had capital, \$3,251,257; deposits, \$15,960,308; and resources, \$21,322,955. One mutual savings bank had depositors, 4127; deposits, \$324,081; and resources, \$335,862.

Railways.—The new railway construction in the calendar year 1898 was 42 miles, and in 1899, 32.50 miles, giving the State a total mileage of 2232.01. At the close of 1899 a line was being constructed from Huntington to Pineville, a distance of about 100 miles, which will open up a new timber region and coal-field, and penetrate Cabell, Lincoln, Logan, Boone, and Wyoming Counties. Another one, requiring several bridges and an estimated outlay of \$800,000, was under contract, to extend from Elkins, on the West Virginia Central road, to the forks of the Greenbrier River, 43 miles, and there connect with a new line under construction along the Greenbrier Valley. Railway property was assessed for taxation at \$22,028,362.

Education.—At the close of the school year 1897-98 the school population was 302,354; enrolment in the public schools, 236,188; and average daily attendance, 159,768. There were 6808 teachers, 5856 buildings used as school-houses, and public school property valued at \$3,471,697. The revenue was \$1,933,718; expenditure, \$2,046,623, of which \$1,168,191 was for teachers' salaries. There were 28 public high schools, with 79 secondary teachers, 1778 secondary students, and 285 elementary pupils; 14 private secondary schools, with 56 teachers, 655 secondary students, and 799 elementary pupils; 7 public normal schools, with 49 teachers and 1475 students in all departments; and 3 private ones, with 19 teachers and 450 students. Normal training was also given in 2 colleges and 1 public high school. Three universities and colleges for men and for both sexes reported 2 fellowships, 63 professors and instructors, 808 students, 18,600 volumes in the libraries, \$51,000 invested in scientific apparatus, \$520,000 in grounds and buildings, and \$114,750 in productive funds, and \$90,836 in total income. One college for women reported 4 professors and instructors, 42 students, grounds and buildings valued at \$6500, and total income of \$4500. In 1899 there were 193 periodicals, of which 18 were dailies, 156 weeklies, and 14 monthlies.

Finances.—The assessed valuations for 1898 were: Real estate, \$147,058,218; personal property, \$53,101,906; and railway property, \$22,028,362—total, \$222,182,486, an increase of \$2,373,586 in a year, chiefly in personal property; tax rate, \$2.50 per \$1000. The State has a permanent school fund of about \$950,000, and no recognized public debt. Another movement for settling the old debt controversy with Virginia has been undertaken.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 965,000.

Legislation.—When the legislature met, January 11, 1899, contests concerning nine seats presented themselves for settlement, and a United States senator had to be elected before ordinary matters of legislation could be considered. On January 25 Nathan B. Scott was elected senator, and on February 7 the final settlement of the suspended contests resulted in giving the Democrats an additional vote in 1901, when a successor to Senator Stephen B. Elkins (Rep.) will be elected. The constitutional amendment, upon which the people will vote in 1900, declares that no charter of incorporation shall be granted to any church or religious denomination, but that

societies may be formed for missionary purposes. It was enacted that the death penalty is to be executed by hanging, within an enclosure in penitentiary walls not open to the public. Three hospitals were established, each under a State board, for free treatment of those hurt in mines and on railroads; others injured or hurt may be treated at cost of the State. Embalmers must be examined and licensed by a State board of embalmers. Eight hours were made a day's labor on all public works. A State board of pardons was created to consider and advise the governor as to pardons, commutations of sentence, and reprieves.

State Officers and National Representatives.—Governor, George W. Atkinson; secretary of state, W. M. O. Dawson; treasurer, M. A. Kendall; auditor, L. M. La Follette; attorney-general, E. P. Rucker; superintendent of schools, J. R. Trotter; adjutant-general, J. W. M. Appleton. Supreme Court of Appeals: President, M. H. Dent; judges, John W. English, Henry Brannon, H. C. McWhorter; clerk, J. A. Holley. The State legislature consists of 49 Republicans and 48 Democrats. Senators, Stephen B. Elkins, from Elkins; and Nathan B. Scott, from Wheeling—both Republicans. Representatives, B. B. Dovener (Rep.), from Wheeling; Alston G. Dayton (Rep.), from Philippi; David E. Johnston (Dem.), from Bluefield; and Romeo H. Freer (Rep.), from Harrisville.

WESTCOTT, EDWARD NOYES, banker-author, was born in Syracuse, N. Y., September 27, 1847, and died there March 31, 1898. He was educated at the public and high schools; compelled by circumstances to give up a college course, he devoted his attention to the banking business. He married Jane Dows, of Buffalo, N. Y., who died in 1890, leaving three children. In 1895 Mr. Westcott was compelled to retire from active business on account of his health, and in the summer of that year he began *David Harum*, which he completed about fifteen months later. The manuscript was read and refused by six publishers in turn, the author meanwhile being confined to his bed, and knowing that recovery was impossible. When the book was finally accepted by the seventh publisher, Mr. Westcott's health actually rallied a little, but only temporarily, and his most earnest desire then was that he might at least live to read the proofs himself, but he died six months before his book appeared. Although published in 1898, *David Harum* was one of the most widely read books of 1899, and at the end of the year its sale had reached upward of half a million copies.

WESTMINSTER, Duke of, HUGH LUPUS GROSVENOR, K.G., born 1825, died December 22, 1899. The Duke of Westminster was in some respects the most important territorial proprietor in Great Britain. His estates included about 30,000 acres of land in Cheshire and Flintshire and 600 acres within the city of London. The latter land is very valuable, being situated in lots within the heart of the city. Long leases made upon these lots are now expiring, making available to the family some of the most valuable real estate in the world. The wealth of the duke was already such as to place him among the richest men in the world, it has been asserted, and the prospective income to the new duke will be very great. The Duke of Westminster sold to William Waldorf Astor a few years ago his estate known as Clivedon, on the Thames, one of the finest estates in England, situated about twenty miles from London. The Duke of Westminster was born at Eton. After graduation at Oxford he represented Chester in Parliament from 1847 to 1868. In 1869 he succeeded his father as marquis. He became a duke in 1874. The Duke of Westminster was Master of the Horse, 1880-86; Lord Lieutenant of Cheshire, 1883, and of the county of London, 1888. Also High Steward of Westminster and aide-de-camp to the Queen. The youngest daughter of the duke, Lady Margaret Evelyn Grosvenor, was married in 1894 to Prince Adolphus Charles Alexander of Teck, grandson of the Queen.

WHARTON, Mrs. EDITH (born Jones), author, is descended on both sides from old New York families; she married Mr. Edward Wharton, a well-known Philadelphian, and has spent several years abroad; she is specially fond of travel. Her first book, a collection of short stories, entitled, *The Greater Inclination*, published early in 1899, was one of the most highly commended books of the year.

WHEAT. The United States produces and exports more wheat than any other single country. In 1899 the production was nearly one-fourth of the wheat crop of the world, Russia, including Siberia, coming next, with about 17 per cent. of the world's supply, and France third, with nearly one-seventh. About one-third of our wheat is exported, mostly to Europe. Large quantities of wheat flour, also, are exported, and the amount is increasing rapidly each year. Russia will probably continue to be the chief competitor of the United States in the world's market. One of the principal features in the increasing growth of wheat in this country has been the concentration of the surplus wheat production in the immense territory west of the Mississippi. Production by States is shown in the following tables of the Department of Agriculture:

STATES AND TERRITORIES.	Acreage.	Average yield per acre.	Production.	Average farm price Dec. 1.	Farm value December 1.
	Acres.	Bushels.	Bushels.	Cents.	Dollars.
Maine.....	1,953	22.5	43,942	91	39.87
New Hampshire.....	511	17.2	8,799	95	8.59
Vermont.....	3,590	22.0	79,389	85	67.38
Connecticut.....	981	15.3	5,490	95	5.25
New York.....	378,620	14.5	7,005,765	80	5,604,612
New Jersey.....	123,370	14.5	1,798,865	75	1,349,148
Pennsylvania.....	1,595,962	13.6	20,472,922	66	13,514,229
Delaware.....	72,856	12.9	932,557	68	634,139
Maryland.....	759,643	14.1	10,710,966	68	7,283,457
Virginia.....	753,625	8.4	6,330,450	69	4,369,570
North Carolina.....	521,731	6.7	3,495,595	62	2,166,369
South Carolina.....	148,271	6.5	963,762	99	954,194
Georgia.....	297,239	6.8	2,021,225	96	1,940,400
Alabama.....	56,735	7.6	431,186	89	383,774
Mississippi.....	3,248	7.7	25,010	78	19,508
Texas.....	814,832	11.1	9,044,635	68	6,150,352
Arkansas.....	227,135	8.6	1,953,361	64	1,250,151
Tennessee.....	953,187	8.7	8,292,727	78	6,466,327
West Virginia.....	417,285	9.3	3,890,751	71	2,755,523
Kentucky.....	901,272	9.1	8,201,575	66	5,413,040
Ohio.....	2,816,761	14.2	39,994,006	64	25,594,724
Michigan.....	1,547,523	8.4	13,323,193	65	8,667,875
Indiana.....	2,587,875	9.8	25,361,175	64	16,231,152
Illinois.....	1,296,541	10.0	12,665,410	63	7,979,304
Wisconsin.....	759,573	15.5	11,773,382	61	7,191,773
Minnesota.....	5,091,312	13.4	68,223,541	55	37,522,969
Iowa.....	1,399,633	13.0	18,195,449	55	10,047,519
Missouri.....	1,151,384	9.9	11,398,702	62	7,067,126
Kansas.....	3,721,229	9.8	36,468,044	52	18,963,383
Nebraska.....	2,018,619	10.3	20,791,776	49	10,187,970
South Dakota.....	3,526,018	10.7	37,728,839	50	18,864,170
North Dakota.....	4,043,643	12.8	51,758,630	51	26,396,901
Montana.....	69,764	25.7	1,792,935	61	1,093,640
Wyoming.....	21,029	18.8	395,345	67	264,461
Colorado.....	809,611	23.7	7,337,781	57	4,182,535
New Mexico.....	186,946	13.8	2,579,855	61	1,573,712
Arizona.....	22,962	15.3	342,139	64	218,969
Utah.....	180,506	20.7	3,736,454	53	1,980,321
Nevada.....	38,167	18.0	687,006	76	522,125
Idaho.....	142,153	24.2	3,440,103	50	1,730,028
Washington.....	956,406	22.7	21,710,394	51	11,072,301
Oregon.....	1,143,205	19.2	21,949,536	53	11,633,254
California.....	2,893,185	14.1	38,743,909	62	20,921,223
Oklahoma.....	1,218,253	13.3	16,302,765	53	8,587,465
United States.....	44,592,516	12.3	547,308,846	58.4	319,545,259

WHEELER, BENJAMIN IDE, A.M., Ph.D., LL.D., president of the University of California, was elected to his present position on June 16, 1899, to succeed Dr. Martin Kellogg, who resigned in 1898. At the time of his election he was professor of Greek and comparative philology at Cornell. He was born at Randolph, Mass., July 15, 1854; graduated at Brown University in 1875; studied at German universities from 1881 to 1885; was called to the chair of comparative philology at Cornell in 1886, and two years later was made professor of Greek. On October 25, 1899, he was inaugurated president of the California university. President Wheeler's writings include: *The Greek Noun-Accent*, 1885; *Analogy, and the Scope of Its Application in Language*, 1887; *The History of Language*, in collaboration with two other scholars; *Principles of Language Growth*, 1891; *The Organization of Higher Education in the United States*, 1897; *Life of Alexander the Great*, 1899. He was the editor of the department of philology in *Macmillan's Dictionary of Philosophy and Psychology* and of the same department in *Johnson's Cyclopædia*; he has contributed to various philological and scientific journals, and was a co-editor of the *Cornell Classical Studies*.

WHIST. In 1899 the national championship tournament in whist was held, as usual, under the auspices of the American Whist League, the meeting place being Chicago. The Hamilton trophy, emblematic of the championship, was won by the Buffalo Whist Club. The national meeting, with representatives from all parts of the country, was continued during one week. The St. Paul Chess and Whist Club won the American Whist League challenge trophy. The prize for pairs, known as the Minneapolis trophy, was won by Messrs. Rollo and Keene, of the Chicago Whist Club. The Brooklyn trophy for auxiliary associations was won by the Atlantic Whist Association, including Baltimore, Washington, Wilmington, and Philadelphia. The Women's Whist League held its third annual congress in 1899 at Washington. The

Washington trophy for teams of four was won by the Ladies' Whist Club of New York.

WHIST LEAGUE, AMERICAN, founded in 1895, had in 1899 a membership of 143 clubs. The general meeting for 1900 is to be at Niagara Falls on July 5. Secretary, C. A. Henriques, 25 West Forty-ninth Street, New York City.

WHISTLER, JOSEPH NELSON GARLAND, colonel, U.S.A., retired, died at Fort Wadsworth, New York harbor, April 20, 1899. He was born in 1822; graduated from the Military Academy at West Point in 1846; served through the Mexican war, and was brevetted first lieutenant for gallantry at the battle of Centrerros. At the outbreak of the Civil War he was captured in Texas by the Confederates; upon his release he was promoted to a captaincy, and served from 1861 to 1863 as instructor of military tactics at West Point. In May, 1863, he was made colonel of the Second New York Artillery, and served in the Richmond campaign, being wounded in a battle before Petersburg, and within the defences of Washington. In 1865 he was brevetted brigadier-general of volunteers, but was mustered out of the volunteer forces, and returned to the regular army. In May, 1883, he was promoted to the colonelcy of the Fifteenth Infantry, and was retired in October, 1886.

WHITE, ANDREW DICKSON, Ph.D., LL.D., United States ambassador to Germany, was appointed by President McKinley chairman of the American delegation to the peace conference which was held at The Hague in May, 1899. Mr. White was born at Homer, N. Y., November 7, 1832, and was educated in the public schools of Syracuse and at Yale University, where he was graduated in 1853. After several months of study in France he became an *attaché* of the American legation at St. Petersburg; he then passed several years in travel and in study at French and German universities, and in 1857 accepted the chair of history and English literature at the University of Michigan. This position he held until 1864, and from the previous year until 1867 was a member of the New York State Senate. At this time Ezra Cornell, who was a member of the legislature, was perfecting plans for founding a university, and Mr. White rendered him considerable assistance, so that when Cornell University was founded Mr. White became its first president. He occupied this position, together with the chair of history, from 1867 to 1885; in the latter year he resigned, and made over to the university his historical library, comprising about 30,000 volumes. In 1871 he was one of the commissioners named by President Grant to study and report upon the question of the proposed annexation of Santo Domingo. In 1878 he was a commissioner to the Paris Exposition. President Hayes appointed him in 1879 minister to Germany, and he secured a two years' leave of absence from Cornell. On January 1, 1896, Mr. White was appointed by President Cleveland a member of the commission to investigate the Venezuela-British Guiana boundary line. The next year he was appointed by President McKinley ambassador to Germany; he has performed the duties of this last high position with ability. He is a regent of the Smithsonian Institution and a member of the Legion of Honor of France. Among his publications may be mentioned *A History of the Warfare of Science with Theology*, 1895, the proceeds of which he gives to the School of History and Political Science at Cornell. The appointment of Mr. White as chairman of the American delegation at The Hague met with general approval.

WHITE, Sir GEORGE STEWART, lieutenant-general in the British army, was in command of the forces in South Africa during the early part of the Boer war, which began with the Boer invasion of Natal on October 12, 1899. On October 21 he defeated the Boers at Elandslaagte, and the next day was reinforced at Ladysmith from Pietermaritzburg; on the 24th he repulsed a Free State force at Rietfontein, and soon after retired to Ladysmith, where his command was shelled on the 30th. Here, by November 2, General White was practically besieged and communications were cut off. General Buller (*q. v.*) was then appointed to the command of the forces in South Africa. During the weeks that followed, the English made several sorties from Ladysmith, and the town was repeatedly shelled by the Boers, and at the close of the year the siege was still in progress. (See TRANSVAAL, paragraphs on History.) General White was born July 6, 1835, and was educated at Sandhurst, entering the army in 1853. He served with distinction during the Indian mutiny with the Royal Inniskilling Fusiliers, and became a captain in 1863, and a major ten years later. In the Afghan war of 1878-80 he served with the Gordon Highlanders, and was present at the battle of Charasia and the capture of Kabul, and took part in the Maidan expedition and the capture of Takti Shah. He received special honor for his services under General Roberts on the march from Kabul to Kandahar, and became military secretary to the viceroy of India. He was promoted lieutenant-colonel in 1881 and colonel in 1885. In this year and in 1886 he commanded a brigade in Burmah, and so distinguished himself that he received the thanks of the Indian government, and was promoted to the rank of major-general. General White also commanded the expedition into Zhob. He was commander-in-chief of the forces in

India from 1893 to 1898, when he was made quartermaster-general of the British army, the last position held by him before going to South Africa.

WHITEING, RICHARD, author and editor, London, was born in that city, July 27, 1840; he was educated privately, and in 1869 married Helen, niece of Townsend Harris, first United States minister to Japan. In 1866 he contributed a series of satirical papers, political and social, to the *Evening Star*, which were afterward republished as *Mr. Sprouts—His Opinions*; he has been connected with the *Morning Star*, the Press Association, the *Manchester Guardian*, both editorially and as Paris correspondent, in which capacity he also served the *London World* and the *New York World*. Publications: Three novels, *The Democracy*, 1876; *The Island*, 1888; and *No. 5 John Street*, 1899, the last-named giving a remarkably vivid description of certain phases of life in the slums.

WIEDEMANN, GUSTAV, professor of chemistry and physics in the University of Leipsic, died in Leipsic, March 24, 1899. He was born October 2, 1826, in Berlin, and was educated there, becoming in 1851 a lecturer in the University. He was called to a professorship at Basel in 1854, at the Polytechnic School in Brunswick in 1863, and at Karlsruhe in 1866. In 1871 he became professor of physical chemistry at Leipsic, where, in 1887, he was appointed to the chair of physics. He devoted himself particularly to magnetism and dynamical electricity. Prominent in his work were the investigations concerning the relations between heat and electricity, and between the mechanical and the magnetic phenomena of bodies, and concerning the dependence of such phenomena on chemical composition. He wrote a work in four volumes entitled *Die Lehre von der Electricität*; after the death of Johann Christian Poggendorff, in 1877, Wiedemann edited the *Annalen der Physik und Chemie*.

WILLEY EXPEDITION See ZOOLOGICAL LITERATURE (paragraph Special Treatises).

WILLIAMS, HENRY WARREN, one of the seven justices of the Pennsylvania Supreme Court, died in Philadelphia, January 25, 1899. He was born at Hartford, Susquehanna County, Penn., in 1830. Having studied law at Wellsboro, he was admitted to the Tioga County bar in 1854. In 1865 Governor Curtin appointed him law judge of the fourth State judicial district, to which position he was afterward repeatedly elected. In 1887 he was elected as a Republican to the Supreme Court for a term of twenty-one years. In 1877 Judge Williams was a representative of the Presbyterian Church of the United States to the Pan-Presbyterian Council at Edinburgh, Scotland. He was active in Sunday-school work and in that of the Young Men's Christian Association. He was prominent in the Masonic order.

WILLIAMS, JOHN, D.D., LL.D., presiding bishop of the Protestant Episcopal Church of the United States, died at his home in Middletown, Conn., February 7, 1899. Born of Unitarian parents in Deerfield, Mass., August 30, 1817, he entered Harvard College in 1831; but after two years of study there he became an Episcopalian, and entered Washington (now Trinity) College, Hartford, where he was graduated in 1835. In the fall of that year he began his theological studies in the General Seminary, New York. He became a tutor in Trinity College; was ordained deacon in 1838; from 1842 to 1848 he was rector of St. George's Church, Schenectady, N. Y., the only pastoral charge he ever held. For the five years succeeding he was president of Trinity College; in 1851 he was consecrated assistant bishop of Connecticut. During his presidency at Trinity his theological influence was so considerable among the students that it resulted in the establishment of the Berkeley Divinity School at Middletown in 1854. From the beginning Bishop Williams was the dean of the institution, and the principal instructor in doctrinal theology. Upon leaving Trinity he was made the vice-chancellor of the college. He succeeded to the chancellorship and to the bishopric of Connecticut in 1865. In 1887 he became presiding bishop of the church in this country. Bishop Williams was a man of remarkable eloquence and scholarship; his influence was exceptionally strong, especially over young men. Besides many contributions to religious periodicals, his writings include: *Ancient Hymns of the Holy Church*, 1845; *Thoughts on the Gospel Miracles*, 1848; *Everlasting Punishment*, 1865; *The English Reformation*, 1881; *The World's Witness to Jesus Christ*, 1882; *The Seabury Centenary*, 1885; *Studies in the Book of Acts*, 1888.

WILLIAMS, Sir MONIER. See MONIER-WILLIAMS, SIR MONIER.

WILLIAMS COLLEGE, at Williamstown, Mass., established in 1793, is non-sectarian and for men only. In the year 1899-1900 there were 34 instructors, 386 students and a library of 44,251 volumes. The college received gifts and bequests to the amount of \$20,478. President, Franklin Carter, LL.D. See UNIVERSITIES AND COLLEGES.

WILLIS, EDMUND AYLBURTON, landscape painter, died February 3, 1899. He was the son of John Aylburton Willis, a professional artist, and was born in Bristol.

England, October 12, 1808. He studied art with his father, and travelled in the interest of his profession in many of the countries of Europe. In 1851 he came to the United States and after making a tour returned to England, but soon came to America again and lived thereafter during most of his life in Brooklyn. His best known picture is "The Prairie Fire." Willis was one of the foremost members of the Brooklyn Art Society. He was the brother of Henry Britton Willis, an artist of some reputation, and a member of the Royal Society of Painters in Water-Colors.

WINDWARD ISLANDS, a colony of Great Britain consisting of a group of West Indian islands lying to the east of the Caribbean Sea between Martinique and Trinidad. The islands comprising the colony are Grenada, the Grenadines, St. Vincent, and St. Lucia (*qq. v.*), having an area of 511 square miles and a population of about 154,100. The islands are under one governor, but there is no common legislature, laws, tariff, or treasury. In these departments each of the islands is separate, except the little group of the Grenadines, which administratively are divided between St. Vincent and Grenada. The governor, who resides at St. George's, Grenada, has been, since January, 1897, Sir Cornelius Alfred Moloney, K.C.M.G. The chief products are sugar, coffee, cacao, spices, etc. Statistics of finance and commerce:

	Revenue.	Expenditure.	Imports.	Exports.
1897.....	£143,008	£141,812	£480,433	£377,641
1898.....	156,990	146,178	554,267	491,254

On August 7 and 8, 1899, a hurricane which swept over the Lesser Antilles and Puerto Rico did a considerable amount of damage in the Windward Islands.

WINES, FREDERICK HOWARD, who was appointed in March, 1899, assistant director of the United States census, was born in Philadelphia, Penn., April 9, 1838. After graduation at Washington College, Penn., in 1857, he studied at the Princeton Theological Seminary, graduating in 1865, having left in the meantime and been licensed to preach by the Presbytery of St. Louis. From 1865 to 1869 he was pastor of the First Presbyterian Church in Springfield, Ill. Mr. Wines has served on many boards of public charities, was a delegate to the International Prison Congress at Stockholm in 1878, and is the author of many statistical books on charities, penal matters, and the liquor question. In 1862-64 he was chaplain in United States Army (regulars).

WINTHROP, WILLIAM R., colonel, United States Army, died at Atlantic City, N. J., April 8, 1899. He was born in 1832; was graduated at Yale in 1852, and then studied law. At the outbreak of the Civil War he entered the Union service in the Seventeenth New York Volunteers. For three years he was with the Army of the Potomac, when he was appointed a judge-advocate. Subsequently he served for a time as professor of law in the Military Academy at West Point. He was the author of *Military Law and Precedents*.

WIRELESS TELEGRAPHY. Considerable progress was made during 1899 in the application of wireless telegraphy to practical uses. Of the several systems for telegraphing without wires, that devised by Signor Marconi has been most before the public. Early in the year messages were successfully sent by this system from South Foreland, England, across the English Channel to Boulogne, France, a distance of 32 miles. A full description of the apparatus used and of the experiments themselves was published in a paper by Signor Marconi, read before the Institute of Electrical Engineers of London early in 1899. In September, 1899, Signor Marconi and several assistants came to America to report the international yacht races off Sandy Hook by wireless telegraphy. Sending apparatus were placed on two steamers which followed the yachts, and receiving apparatus were placed, one on the cable ship *Mackay-Bennett*, anchored near the Sandy Hook lightship, and the other on shore at the Highlands of Navesink. Bulletins of the progress of the races were sent from the following steamers to the receiving stations, and from them by wire to the office of the New York *Herald*. After the yacht races, tests were made by Signor Marconi in conjunction with the Signal Corps of the United States Army and with the Navy Department. The report of the inspecting board in the Navy Department tests was quite favorable to the utility of the system for communicating between vessels at sea. The findings of the board were in full as follows:

"1. It is well adapted for use in squadron signalling under conditions of rain, fog, darkness, and motion of ship. The wind, rain, fog, and other conditions of weather do not affect the transmission through space, but dampness may reduce the range, rapidity, and accuracy by impairing the insulation of the aerial wire and the instruments. Darkness has no effect. We have no data as to the effects of rolling and pitching, but excessive vibration at high speed apparently produced no bad effect on the instruments, and we believe the working of the system will be very little affected by the motion of the ship.

2. The accuracy is good within the working ranges. Cipher and important signals may be repeated back to the sending station, if necessary to secure absolute accuracy.

3. When the ships are close together (less than 400 yards) adjustments (easily made) of the instruments are necessary.

4. The greatest distance that messages were exchanged with the station of Navesink was 16½ miles. This distance was exceeded considerably during the yacht races, when a more efficient set of instruments was installed there.

5. The best location of the instruments would be below, well protected, in easy communication with the commanding officer.

6. The spark of a sending coil or of a considerable leak, due to faulty insulation of the sending wire, would be sufficient to ignite an inflammable mixture of gas or other easily lighted matter, but with the direct lead (through air space, if possible) and the high insulation necessary for good work, no danger of fire need be apprehended.

7. When two transmitters are sending at the same time, all the receiving wires within range receive the impulses from transmitters, and the tapes, although unreadable, show unmistakably that such double sending is taking place.

8. In every case, under a great variety of conditions, the attempted interference was complete. Mr. Marconi, although he stated to the board, before these attempts were made, that he could prevent interference, never explained how nor made any attempts to demonstrate that it could be done.

9. Range of signalling: Between large ships (heights of masts 130 to 140 feet above the quarter deck), the range is at least 35 miles at sea and 16½ miles or less when tall buildings of steel frames interfere. Between a large ship (height of mast, 140 feet) and a torpedo-boat (height of mast 45 feet), across open water, signals can be read up to 7 miles on the torpedo boat, and 8½ miles on the ship. Communication might be interrupted altogether when tall buildings of iron framing intervened.

10. The rapidity is not greater than 12 words per minute for skilled operators.

11. The shock from the sending coil of wire may be quite severe and even dangerous to a person with a weak heart. No fatal accidents have been recorded.

12. The liability to accident from lightning has not been ascertained.

13. The sending apparatus and wire would injuriously affect the compass if placed near it. The exact distance is not known and should be determined.

14. The system is adapted for use on all vessels of the navy, including torpedo boats and small vessels, as patrols, scouts, and dispatch boats, but it is impracticable in a small boat.

15. For landing parties the only feasible method of use would be to erect a pole on shore and then communicate with the ship.

16. The system could be adapted to the telegraphic determination of differences of longitude in surveying.

The board respectfully recommends that the system be given a trial in the navy."

It is a matter of particular interest to electricians that an actual field test of wireless telegraphy in war is being conducted in the Boer-British campaign which is being carried on in South Africa. Conflicting reports have been published respecting the operation of the system in South Africa, but they are not circumstantial enough to enable fair conclusions to be drawn. During the year Professor Zickler, of Brunn, Moravia, announced the invention of a new system of wireless telegraphy. So far the work done by Professor Zickler appears to have been purely experimental.

WISCONSIN, a northern lake State of the United States, with an area of 56,040 square miles. Capital, Madison. Wisconsin became a State May 29, 1848.

Mineralogy.—In the calendar year 1898 the State increased its output of quarry products over that of the previous year by more than \$150,000, the values being, granite, \$175,867; sandstone, \$80,341, and limestone, \$698,454—in all, \$954,662. Of the limestone, \$167,875 were used for building purposes, \$111,726 for paving and road-making, and \$367,720 for burning into lime. Iron-mining, principally in those parts of the famous Menominee and Gogebic ranges that lap over from Michigan, yielded 509,645 long tons, all red hematite, valued at \$687,913. The single coking plant, with 120 ovens, more than doubled its production of 1897, using 59,900 short tons of coal, and yielding 35,280 short tons of coke, valued at \$123,480. Of pig-iron 172,781 long tons were produced.

Agriculture.—A suggestive agricultural feature of 1899 was the success of the tobacco-growing experiment, made in consequence of the steadily falling price of corn and pork. The crop of the year was 125,000 cases of 125 pounds each, a total of 15,525,000 pounds. Unlike the tobacco of Virginia and North Carolina, the Wisconsin product is made up wholly into cigars. The return of Wisconsin tobacco is between 1200 and 1500 pounds to the acre; the average planting is seven acres to the farm, and the average value of the crop is \$95 to the acre. Like cotton in the South, tobacco in Wisconsin is considered as ready money, because of the ease with which the crop is converted into cash.

Manufactures.—In the fiscal year ending June 30, 1899, the collections of internal revenue on taxable manufactures aggregated \$9,467,065. There were 96 manufactories of tobacco and 1060 of cigars, and the combined output was 79,875,895 cigars, 2903 pounds of plug tobacco, 475,610 pounds of fine cut, 4,743,873 pounds of smoking, and 3743 pounds of snuff. The quantity of spirits rectified was 1,379,888 gallons; distilled spirits gauged, 6,492,250 gallons, and fermented liquors produced, 2,797,188 barrels.

Commerce.—During the fiscal year ending June 30, 1899, the imports of merchandise at the port of Milwaukee aggregated in value \$624,557; exports, \$1327, a decrease of \$50,461 in imports and \$3188 in exports, and making the total direct foreign trade of the year \$625,884.

Banks.—On October 31, 1899, there were 79 national banks in operation and 46 in liquidation. The active capital aggregated \$9,685,000; circulation, \$3,433,359; deposits, \$63,744,405, and reserve, \$19,642,362. The State banks, July 3, 1899, numbered 133, and had capital, \$6,783,425; deposits, \$42,456,830, and resources, \$51,419,731; and private banks, 116, with capital, \$1,127,039; deposits, \$8,632,902, and resources, \$10,361,710. One mutual savings bank had depositors, 2350; deposits, \$405,196, and resources, \$430,052. The exchanges at the United States clearing house at Milwaukee, in the year ending September 30, 1899, aggregated \$278,715,347, an increase of \$10,225,866 in a year.

Railways.—The new railway construction in the calendar year 1898 was 63.81 miles, and in 1899, 99.92 miles, giving the State a total mileage of 6480.61.

Education.—At the close of the school year 1897-98, the school population was 708,535; enrolment in the public schools, 435,914, and average daily attendance, 287,000. There were 12,465 teachers, 6940 buildings used as schools, and public school property valued at \$14,800,000. The revenue was \$5,403,431; expenditure, \$5,132,063, of which \$3,577,978 was for teachers' salaries. There were 182 public high schools, with 609 secondary teachers, 16,796 secondary students, and 1329 elementary pupils; 26 private secondary schools, with 145 teachers, 1200 secondary students, and 1402 elementary pupils; 7 public normal schools, with 149 teachers and 4451 students in all departments; and 2 private ones, with 22 teachers and 260 students. Normal training was also given in 3 colleges and 12 public high schools. Ten universities and colleges for men and for both sexes reported 18 fellowships, 58 scholarships, 254 professors and instructors, 3304 students, 131,142 volumes in the libraries, \$151,500 invested in libraries, \$382,500 in scientific apparatus, \$2,596,000 in grounds and buildings, and \$1,662,091 in productive funds, \$497,903 in total income, and \$80,129 in benefactions. One college for women reported 17 professors and instructors, 170 students, 4121 volumes in the library, \$40,000 invested in grounds and buildings, and \$150,000 in productive funds, \$34,500 in total income, and \$18,500 in benefactions. In 1899 there were 685 periodicals, of which 64 were dailies, 554 weeklies, and 48 monthlies.

Finances.—The assessed valuations for 1898 were: Real estate, \$482,283,031; personal property, \$117,716,769—total, \$600,000,000, a decrease of \$28,504,011 in a year; State tax rate, \$2.48 per \$1000; amount of tax raised, \$1,918,779. The entire indebtedness of the State is held in trust funds, as follows: School Fund, \$1,563,700; Normal School Fund, \$515,700; University Fund, \$111,000, and Agricultural College Fund, \$60,600—total, \$2,251,000.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 2,150,000.

Legislation.—Age of consent was changed from 14 to 18 years. Judges must file oaths prior to receipt of salary that no cause pending has remained undecided for ninety days after submission. "Renovated butter" must be stamped and sold as such. Primary elections and caucuses are stringently regulated. In the interests of health, factories and workshops are regulated very strictly as to sanitation, air space and conveniences; clothing and cigars cannot be manufactured in living rooms except by members of the family, nor cigars manufactured underground; and the milk supply is carefully examined. Trees and nursery stock must be inspected and the incurably diseased destroyed. Travelling libraries were provided for. Labor legislation was not neglected: The places of payment of time-checks were fixed; notice to quit employment or discharge employee must be reciprocal; it was made a finable offence to threaten discharge or to promise higher wages to influence a person's vote, or to coerce any person to agree not to join any labor union as a condition for employment; and seats must be furnished for female employees. Minors under 14 shall not be employed except during public school vacations; those under sixteen must not work more than 10 hours in any one day, and only between 6 A.M. and 10 P.M. Marriage licenses have not heretofore been required in Wisconsin, and inhabitants of adjoining States have not hesitated to make of it a veritable Gretna Green; hereafter license must be obtained at least five days before marriage. It is unlawful for any political committee, candidate for office, State, county or municipal officers, to ask for or receive any pass or frank on any railroad, express, or telegraph company, for

the free transmission of any person, property, or message; the penalty for violation of this law is a fine of from \$200 to \$1000, or imprisonment in the penitentiary not less than one nor more than five years. A very extensive tax law was passed looking to a uniform and improved system, and a commissioner of taxation is to be appointed; taxes are even imposed on gifts and legacies of property worth over \$10,000, 5 per cent. when not to an immediate heir, and 1 per cent. to those of kin. Legislative agents and counsel employed to promote or oppose legislation affecting the pecuniary interests of any person or corporation must have their names recorded in a legislative docket provided for the purpose, under heavy penalty, and within thirty days after adjournment of the legislature the employer must file with the secretary of State a sworn statement showing in detail all the expenses and expenditures of such agent or counsel.

State Officers and National Representatives.—Governor, Edward Scofield; lieutenant-governor, Jesse Stone; secretary of State, W. H. Froehlich; treasurer, J. O. Davidson; attorney-general, E. R. Hicks; superintendent of education, L. D. Harvey; insurance commissioner, E. Giljohan; railroad commissioner, Graham L. Rice. Supreme Court: Chief justice, John B. Cassoday; associate justices, John B. Winslow, C. V. Bardeen, J. E. Dodge, Roujet D. Marshall; clerk, Clarence Kellogg. The State legislature consists of 111 Republicans and 22 Democrats. Senators, John C. Spooner, from Madison; and Joseph V. Quarles, from Milwaukee—both Republicans. Representatives, Henry A. Cooper, from Racine; Herman B. Dahle, from Mount Horeb; Joseph W. Babcock, from Necedah; Theobald Otjen, from Milwaukee; Samuel S. Barney, from West Bend; J. H. Davidson, from Oshkosh; John J. Esch, from La Crosse; Edward S. Minor, from Sturgeon Bay; Alexander Stewart, from Wausau; John J. Jenkins, from Chippewa Falls—all Republicans.

WISCONSIN, UNIVERSITY OF, at Madison, organized in 1849 and reorganized in 1866, is nonsectarian and coeducational; has colleges of arts and science, mechanics, engineering, law, pharmacy, agriculture, music; a department of university extension and a summer school. The enrolment in 1899-1900 was 2422 students. There were 140 instructors. President, Charles Kendall Adams, LL.D.

WOMEN'S CHRISTIAN TEMPERANCE UNION, NATIONAL, organized November, 1874, had in 1899 a membership of 300,000. Its purpose is to educate the young, form a better public sentiment, reform the drinking classes, and secure the entire abolition of the liquor traffic. The society publishes the *Union Signal* and the *Young Crusader*. General meeting for 1900, Washington, D. C., in November. President, Mrs. Lillian M. N. Stevens; secretary, Mrs. Susanna M. D. Fry, Rest Cottage, Evanston, Ill. Headquarters in Chicago.

WOMEN'S SUFFRAGE ASSOCIATION, NATIONAL AMERICAN, organized in 1868. It seeks to organize public sentiment in favor of woman suffrage in all the States of the Union. General meeting for 1900 to be held in Minneapolis, Minn. President, Miss Susan B. Anthony; secretary, Mrs. Rachel Foster Avery, 1483 North Fifty-second Street, Philadelphia.

WOOD. See NON-INFLAMMABLE WOOD.

WOOD, Commander EDWARD P., died at Washington, December 11, 1899, by disease contracted in the tropics during the Spanish war. Commander Wood was in command of the gunboat *Petrel* at the battle of Manila. His vessel, being of light draught, was especially active in destroying the Spanish boats that had sought shelter under the guns of Cavite, and in silencing the land batteries. The sailors and marines from the *Petrel* captured the navy yard at Cavite. Commander Wood was detached from the Asiatic station in December, 1898. For his services in the battle of Manila he was advanced ten numbers in grade. He was born at Mansfield, O., in 1848, was graduated from the United States Naval Academy in 1867, and served through the various grades to that of commander, which he received in July, 1897.

WOOD, General LEONARD. See CUBA.

WOODBURY, Judge E. W., framer of the first prohibitory law in the State of Maine, died at Bethel, Me., January 22, 1899, in his eighty-second year. He was well known as a speaker at political, religious, and temperance meetings. He had served in both houses of the legislature, and had been superintendent of the State Reform School, chairman of the executive committee of the Maine Congregationalist, and president of the Maine Bible Society.

WOOL and WOOLLEN MANUFACTURE. The year 1899 was one of the most remarkable ever experienced in the wool trade of the United States. Owing to a demand greatly in excess of the supply both in this country and abroad, the available stock had been very thoroughly cleared up at the end of the year, and prices had risen to what would have been an exorbitant figure twelve months previously. The following figures, compiled from the most reliable statistics which were available,

show briefly the main facts relative to the production of wool in the United States in 1899 as compared with the previous year.

ITEM.	1898.	1899.
Number of sheep on January 1	37,656,960	38,114,453
Value of flock	\$32,721,123	\$107,697,530
Total wool clip in pounds	266,720,684	272,191,230
Amount of pulled wool, pounds		32,754,761
Average weight of fleece, pounds	5.8	5.95
Total imports, pounds	132,795,369	76,785,909
Total exports, pounds	3,625,971	14,095,335
Total supply on hand January 1	339,033,353	157,396,579

The greatest demand of the year was in clothing wools, and although all the mills of the country were run to their full capacity and new mills were built (see TEXTILE MILLS) and existing plants were largely increased, the supply did not overtake the demand. In this line of woollen goods the prices advanced between 30 per cent. and 40 per cent. during the year. The advance in prices of carpet wools was less marked.

WOOLF, MICHAEL ANGELO, a well-known newspaper artist, died in Brooklyn, New York, March 4, 1899, in his sixty-third year. He was born in England, came to America when twelve years old, became an actor, and finally, having studied at an art school, entered upon what proved to be his life-work. Woolf has been called the father of the modern comic picture; his drawings are forceful, sometimes rude, and depict types rather than particular individuals. He was the artist of the waifs, for the work he enjoyed most thoroughly, and on which his reputation in large part rests, was the portrayal of the children of the streets; these drawings were almost always half-humorous, half-pathetic. Woolf's work rarely fell to the order of the mere cartoon; he put forth, however, some vigorous drawings of this kind during the Tweed scandal and the Hayes-Tilden campaign. His work appeared chiefly in the Harpers publications.

WORCESTER, DEAN CONANT, assistant professor of zoology in the University of Michigan, was appointed by President McKinley a member of the Philippine commission, the announcement of which was made January 17, 1899. Professor Worcester was born at Thetford, Vt., October 1, 1866. In 1887-88 he was a member of the Steere scientific expedition to the Philippine Islands, and in the following year was graduated at the University of Michigan, and became an assistant in the department of botany in that institution. He returned to the Philippines in 1890 as one of the leaders of the Menage scientific expedition, and remained until 1893, when he became an instructor in zoology at his alma mater; since 1895 he has been assistant professor of zoology. The time he passed in the Philippines was given not only to scientific study of the fauna of the islands, but to historical research, and to careful observations of the people and existing conditions. He has written various papers on the birds and mammals of the Philippines, and in October, 1898, published *The Philippine Islands and Their People*.

WRESTLING. See BOXING AND WRESTLING.

WRIGHT, HORATIO GOUVERNEUR, brigadier-general, United States Army, retired, died in Washington, D. C., July 2, 1899. He was born at Clinton, Conn., March 6, 1820; was graduated from the United States Military Academy at West Point in 1841, ranking second in his class. For a brief time he served in the engineer corps, and in 1842-44 was an instructor at West Point, first in French and later in engineering. He became a lieutenant in 1848, and during the next seven years superintended the construction of fortifications in Florida. In 1855 he was promoted to a captaincy and was transferred to Washington, where he became assistant to the chief engineer, retaining the position until the outbreak of the Civil War. Wright took part in the first battle of Bull Run as chief engineer of Heintzelman's division, and he commanded the second division in the Port Royal expedition. In August, 1861, he was promoted to the rank of major, and in the following month to that of brigadier-general of volunteers. In 1862 he commanded the expedition that took Fernandina, Fla., and in July of that year became major-general of volunteers, after which until the following March he was successively in command of the department of the Ohio and the district of Louisville. In the battle of Gettysburg he commanded a division of the Army of the Potomac. In May, 1864, he was brevetted colonel, United States Army, for gallantry at Spottsylvania, and in the same month succeeded to the command of the Sixth Corps after the death of General Sedgewick, and was in command during the Richmond campaign. General Wright took a prominent part in the battle of Cedar Creek. On April 2, 1865, he took his entire corps through the Confederate lines at Petersburg, for which he was brevetted major-general, United

States Army. He was wounded both at Spottsylvania and at Cedar Creek. He served through the war, and at its close returned to the engineer corps, of which he became chief in 1879. On June 14, 1865, the legislature of Connecticut, his native State, tendered to General Wright the thanks of the State for his eminent services in the war. In March, 1884, he was retired from active service.

WYOMING, a northwestern State of the United States, with an area of 97,890 square miles. Capital, Cheyenne. Wyoming became a State on July 10, 1890.

Mineralogy.—In the calendar year 1898 the State reached its maximum production of coal, and gained third place among the coal States west of the Mississippi and second among the Rocky Mountain States. The output was 2,863,812 short tons from 23 mines, valued at \$3,664,190, an increase of 265,926 short tons in a year. Nearly one-half of the entire production was from Sweetwater County, Uintah and Weston ranking second and third. The yield of the precious metals was, gold, 257 fine ounces, value \$5300, and silver, 100 fine ounces, coining value, \$129. A notable advance was made in copper-mining, because of recent discoveries, an output of 233,044 pounds being won. Quarrying yielded sandstone to the value of \$6382, and coking declined to a product of 18,350 short tons, valued at \$64,225. Toward the close of 1899 further discoveries of rich copper ore were made in Plumbago Cañon, at a point about 25 miles north of Laramie, and in the Owl Creek Mountains, about 100 miles northwest of Casper. A carload of ore from the first strike showed 50 to 75 per cent. copper and 8 ounces of silver to the ton; in the second strike the vein was found to be four feet wide. There was a rush of Colorado miners to both localities as soon as the strikes were made known. In December a company was organized in Chicago, with a capital of \$3,000,000, to establish a great coal and coke industry in Sweetwater County, a large tract was acquired, containing seven distinct veins of high-grade coal, and before the end of the month buildings for power plants, company stores, and cottages for workmen were in course of erection. Both marine and fresh-water Jurassic beds are found to exist in Wyoming.

Agriculture.—With the co-operation of Charles U. Shepard, whose successful experiments in tea-growing at Pinehurst, S. C., are noted in the article on South Carolina, the United States Department of Agriculture took the first steps looking to the introduction of tea-growing into Wyoming in 1899. Professor Elwood Mead, of Cheyenne, expert in charge of the irrigation bureau of the department, was placed in immediate charge of the experiment, and the preliminary work will consist in the establishment of an effective system of irrigation.

Manufactures.—Wyoming is included in the internal revenue district of Colorado, and the details of its taxable manufactures are combined with those of that State. In the fiscal year ending June 30, 1899, the collections in Wyoming alone aggregated \$50,633.

Banks.—On October 31, 1899, there were 11 national banks in operation and 4 in liquidation. The active capital aggregated \$860,000; circulation, \$178,399; deposits, \$3,081,722; and reserve, \$1,048,820. The State banks, June 30, 1899, numbered 8, and had capital, \$152,000; deposits, \$433,255; and resources, \$648,483, and private banks, 11, with capital, \$189,517; deposits, \$1,066,465, and resources, \$1,290,146.

Railways.—The new railway construction in the calendar year 1898 was 6 miles, and in 1899, 53.69 miles, giving the State a total mileage of 1224.26.

Education.—No school census is taken in this State. At the end of the school year 1897-98 the school population was estimated at 23,950; the enrolment in the public schools was 13,042, and average daily attendance, about 8700. There were 536 teachers, 338 buildings used as school-houses, and public school property valued at \$441,460. The revenue was \$217,395; expenditure, \$213,291, of which \$160,222 was for teachers' salaries. There were 5 public high schools, with 12 secondary teachers, 307 secondary students, and 185 elementary pupils; one private secondary school, and a State university, with 14 professors and instructors, 168 students, 5750 volumes in the library, \$60,000 invested in scientific apparatus, and \$111,540 in grounds and buildings, and \$47,243 in total income. In 1899 there were 45 periodicals, of which 5 were dailies and 37 weeklies.

Finances.—The assessed valuations for 1899 aggregated \$35,578,806, the highest ever reached, and an increase of \$4,789,515 in a year; tax rate, \$6.25 per \$1000. The total debt, all bonded, February 1, 1899, was \$320,000, comprising Capitol Building bonds, \$150,000; insane asylum bonds, \$30,000; public building bonds, \$90,000, and university building bonds, \$50,000. On the aggregate, a total of \$32,000 is payable annually, beginning January 1, 1902.

Population.—As estimated by federal officials, the population on June 30, 1899, was about 91,000.

Legislation.—Among the new boards created were: a State Board of Medical Examiners, no person hereafter to be allowed to practise without examination and license; and county, city and town boards of health, with extraordinary powers of investigation, regulation and eradication of all sources of disease, including the erec-

tion of pest houses and the destruction of infected property. The office of game warden was created, and game and fish are protected and preserved by very stringent laws. Bounties, both State and county, are given for the destruction of certain wild animals. An elaborate law was passed regarding the selection of jurors and the performance of jury duty. Woman suffrage obtains in Wyoming, but a juror must be a male citizen, able to understand the English language, whose name appears upon the last assessment roll. Husband and wife may be witnesses against each other in many cases in which hitherto they were barred. In cases where a husband spends his earnings for liquors or in gambling, and his wife and children are deprived of the common necessities of life, the wife may serve notice upon the liquor dealer not to furnish liquor to him, or the gambling house not to permit him to game, after which the keeper of the liquor or gaminghouse is liable for all damages to wife or children. Schools are to be furnished with free text books. Head-gear obstructing the view of any other person in a theatre must be removed or a fine paid. Persons who derail trains, board trains to rob, place explosives upon the track with intention to blow up or derail, or fire bridges or trestles with intent to wreck cars or trains, shall be punished with death or life imprisonment.

State Officers and National Representatives.—Governor, De Forest Richards; secretary of State, F. Chatterton; treasurer, G. E. Abbott; auditor, Leroy Grant; adjutant general, Frank A. Stitzer; attorney general, J. A. Van Orsdel; superintendent of Education, T. T. Tynan. Supreme Court: Chief justice, C. N. Potter; associate justices, Samuel T. Corn, Jesse Knight; clerk, R. C. Morris. The State legislature consists of 48 Republicans and 9 Democrats. Senators: Clarence D. Clark, from Evanston, and Francis E. Warren, from Cheyenne—both Republicans. Representative (at large), Frank W. Mondell (Rep.), from Newcastle.

X-RAYS. See ROENTGEN RAYS.

YACHTING. *The International Races.*—The eleventh regatta for the America's Cup took place in October, at New York, under the auspices of the New York Yacht Club. The contest was won in three straight races by the American boat *Columbia*, owned by J. Pierpont Morgan, commodore of the N.Y.Y.C., and C. Oliver Iselin, managing director of the *Columbia*. The challenging boat, *Shamrock*, was owned by Sir Thomas Lipton, of the Royal Ulster Yacht Club. After seven successive failures, due to lack of wind, the first race was sailed on October 16 in a moderate breeze, over a course fifteen miles to windward and return. The defender won by more than a mile. On the following day the yachts started over a triangular course, each leg being ten miles. The *Shamrock*, when 25 minutes out, was put out of commission by the parting of her shroud, thereby breaking her top-mast and losing her club top-sail. The *Columbia*, according to agreement, sailed over the remainder of the course alone, being about even with the *Shamrock* when the crash came. *Shamrock* was repaired in the Erie Basin, 3300 pounds of lead were put on board, and the yacht was remeasured. The extra lead increased her water-line, and she gave an allowance to *Columbia* of 16.20 seconds. On the 19th there was again no wind. On October 20 there was a half-gale blowing, and the yachts made a spectacular race, 15 miles to leeward and return, through seas that swept the decks, the *Columbia* again proving herself the superior sailor. The summaries follow:

FIRST RACE.						
	Start.	Outer(First) Mark.	Second Mark.	Finish.	Elapsed Time.	Corrected Time.
<i>Columbia</i>	H. M. S. 11:01:06	H. M. S. 1:48:19	H. M. S.	H. M. S. 3:54:59	H. M. S. 4:53:53	H. M. S. 4:53:53
<i>Shamrock</i>	11:01:03	1:58:06	.....	4:05:10	5:04:07	5:04:01
SECOND RACE.						
<i>Columbia</i>	11:00:17	12:39:28	1:33:27	2:37:17	3:37:00	
<i>Shamrock</i>	11:00:15	Did not finish.	.....	.....	.....	.....
THIRD RACE.						
<i>Columbia</i>	11:01:35	1:17:25	.....	2:21:00	3:38:25	3:38:09
<i>Shamrock</i>	11:00:34	1:18:43	.....	2:26:00	3:44:43	3:44:43

The cup races of 1899 were unusually well managed and the America's Cup was sailed for under perfect policing conditions. Still better, there was an entire absence of those elements of disagreement by which a former contest was unfortunately characterized. No challenger, perhaps, has so won the respect of the sport-loving public as Sir Thomas Lipton. A loving cup was presented to him by a committee of citizens at the time of his departure for England. In his acceptance he testified to his belief that the *Columbia* was the better boat and to his intention to try for the America's Cup again at the earliest opportunity.

Important Cruises and Regattas.—The annual cruise to Newport of the squadron of the New York Yacht Club, the oldest and most distinguished society of its kind in the country, took place in August, 1899, and was the most successful, in many respects, of the many runs over the famous Long Island Sound course. The omission of the 1898 cruise on account of the war with Spain heightened to a considerable degree the interest in the run of the succeeding year. The cruise was especially remarkable for the attendance of the two great cup-defenders *Columbia* and *Defender*, and their fight to determine the qualities of the new product of the Herreshoffs. There were present also many other famous boats among the two hundred or more yachts that gathered at the rendezvous at New London. They included the *Vigilant*, the *Mayflower*, the *Navahoe*, the *Gloriana*, and the old schooner *America*, still a staunch boat. In addition to these, the fleet was met off Narragansett Pier by the *Volunteer*, with the well-known skipper Hank Haff on board. There were numerous races among the various classes of boats, including steam-yachts, the great sloops and schooners, the thirty-footers, and even the launches and small boats. In the more important contests the old racers were prominent, and *America* held her own till disabled by an accident. The *Vigilant* on August 9 led the fleet by nearly a minute. This yacht won the rear commodore's cup. In the race for the Astor cups the *Columbia* won the cup for sloops, beating the *Defender*, and the *Amorita* won the cup for schooners. The latter won also the wind-up cup, given by Commodore Morgan, and the vice-commodore's cup, awarded for the greatest number of winning runs during the cruise. The Atlantic Yacht Club also had a successful cruise in 1899. The cruise finished with a magnificent ocean race from Shelter Island to Sandy Hook, an air distance of 138 nautical miles, but nearly three times as much over the course actually sailed. The schooner *Katrina* led almost to the finish, when she was passed by the *Ramona* and *Coronet*. As it was she won on time allowance, *Sachem* second, and took the Adams cup for schooners. The four competing boats finished the long race within five minutes. The Adams cup for sloops was won by the *Awa*. Later in the year the *Katrina* won the Gould cup for schooners. The Larchmont Yacht Club held a week of racing on Long Island Sound. Later in the year the *Colonia* won the Larchmont cup for schooners. See further SPORTS, INTERNATIONAL, for the Canada's Cup and the Seawanhaka-Corinthian trophy races.

YALE UNIVERSITY, at New Haven, Conn., completed its one hundredth and ninety-eighth year in June, 1899, when the resignation of President Dwight, who had served the university thirteen years in that capacity, went into effect, and the new president, Arthur T. Hadley, took up his work. On May 25 William W. Farnum, treasurer of the university since 1888, presented his resignation, and also Professor Franklin B. Dexter, secretary of the corporation since 1869. In March Professor James M. Hoppin, after twenty years' services, gratuitously rendered, resigned the chair of the History of Art. Professor George J. Brush was elected chairman of the Board of Trustees of the Peabody Museum, to fill the vacancy created by the death of Professor O. T. Marsh, and Professor Charles E. Beecher was appointed curator of the geological collection. A large number of valuable gifts were received by the university during the year. For the galleries of the art school Mrs. Nathan A. Baldwin presented a large and valuable Japanese cloisonné vase more than six feet in height. The anniversary of the art school occurred on the first of June, 1899, on which occasion three valuable gifts were made which will be especially useful and helpful to the school. Professor Charles E. Beecher gave to the Peabody Museum his entire scientific collections, comprising upward of 100,000 specimens, mostly of invertebrate fossils. Taken altogether, the gifts, with the contributions and subscriptions already made for the bi-centennial fund, amounted to more than \$500,000. For statistics see UNIVERSITIES AND COLLEGES.

YAQUIS. See MEXICO (paragraph the Yaqui Rebellion).

YATES, Colonel JOHN B., died October 18, 1899, at the age of 66 years. On the outbreak of the Civil War he enrolled a company of the First Michigan Engineers, and was successively commissioned captain, major, and colonel, 1864. As colonel of the Michigan engineers he was of great service to General Sherman in bridge-building during the march from Atlanta to the sea, a work of hard and constant labor and responsibility. He began life as an axeman in the engineer corps of the Utica and Schenectady Railroad. At the close of the war he was appointed by President John-

son military superintendent of railroads for the State of Tennessee, a position which he retained throughout the reconstruction period. He then returned to his native city and to the practice of his profession, civil engineering.

YELLOW FEVER. During September and the first part of October, 1899, an epidemic of yellow fever prevailed at Key West. The total number of cases reported up to December 22, 1899, at this place was 1320, with 66 reported deaths. At Miami, Fla., there were reported 133 cases with 10 deaths, and at Port Tampa City, Fla., 10 cases reported with 1 death. In New Orleans there was an epidemic beginning August 27. Up to December 22, 1899, there had been 115 cases reported with 20 deaths. Baltimore, Md., had 1 case, which died at quarantine station. From Mississippi were reported 90 cases, distributed as follows: Centreville, 2 cases; Jackson, 61 cases; Mississippi City, 27 cases, besides an unknown number of cases at Flora. There were 11 deaths reported in the State up to December 22, 1899. There were a few cases at Havana and Cabanas, but the epidemic in each instance was promptly controlled.

In Vera Cruz, Mexico, yellow fever of a malignant type prevailed during May, nearly half the cases proving fatal.

Two cases reached New York City, one of which died, and one fatal case reached Brooklyn. (See SERUM THERAPY.) On July 31 an outbreak of yellow fever was announced at the Soldiers' Home, at Hampton, Va. There were 44 cases and 11 deaths, the last case being found on August 7. Over 1500 men were transferred to tents, from the home, and their quarters were disinfected before their return.

On November 8, 1897, Past Assistant Surgeon (now Surgeon) Eugene Wasdin and Past Assistant Surgeon H. D. Geddings were detailed, by authority of the secretary of the treasury and the President, as a commission to investigate in Havana the nature of yellow fever. Their report, dated July 10, 1899, was published in the following month. The report embodies the work of the commission in fairly testing the claim of Professor Giuseppe Sanarelli, of Bologna, Italy, and the University of Montevideo, that the bacillus icteroides is the cause of yellow fever, and the conclusion is drawn that this famous scientist has isolated the true cause of the terrible scourge. Fourteen cases of undoubted yellow fever were examined in the well-equipped bacteriologic laboratory of the Marine Hospital Service in Havana. From 13 of these cases the commission isolated the organism of Sanarelli, the bacillus icteroides, and in the remaining case an independent observer isolated it from tube cultures taken at a necropsy conducted by the commission. From the living blood of 12 of the 14 cases, abstracted not earlier than the third day of the disease, the organism was isolated, and in the other two it was obtained post-mortem. The commission having preserved a number of cultures made at the isolation hospital in the city of New Orleans from cases seen during the epidemic of 1897, also isolated therefrom the bacillus icteroides in the proportion of 83.33 per cent. of the cases examined, the cultures having been made at necropsy. Thus the identity of the bacillus icteroides of our Southern States with that found in Cuba and that sent the commission by Professor Sanarelli, which was obtained in South America, was established. After a number of interesting experiments the commission arrived at the following conclusions: '1. The micro-organism discovered by Professor Giuseppe Sanarelli, of the University of Bologna, Italy, and by him named 'bacillus icteroides,' is the cause of yellow fever. 2. Yellow fever is naturally infectious to certain animals, the degree varying with the species; in some rodents local infection is very quickly followed by blood infection; and while in dogs and rabbits there is no evidence of this subsequent invasion of the blood, monkeys react to the infection the same as man. 3. Infection takes place by way of the respiratory tract, the primary colonization in this tract giving rise to the earlier manifestations of the disease. 4. In many cases of the disease, probably a majority, the primary infection, or colonization in the lungs, is followed by a "secondary infection," or a secondary colonization of this organism in the blood of the patient. This secondary infection may be complicated by the co-instantaneous passage of other organisms into the blood, or this complication may arise during the last hours of life. 5. There is no evidence to support the theory advanced by Professor Sanarelli that this disease is primarily a septicemia, inasmuch as cases do occur in which the bacillus icteroides cannot be found in the blood, or organs in which it might be deposited therefrom. 6. There exists no causal relationship between the bacillus 'x' of Sternberg and this highly infectious disease; and the bacillus 'x' is frequently found in the intestinal content of normal animals and of man, as well as in the urine and the bronchial secretion. 7. So far as the commission is aware, the bacillus icteroides has never been found in any body other than one infected with yellow fever; and whatever may be the cultural similarities between this and other micro-organisms, it is characterized by a specificity which is distinctive. 8. The bacillus icteroides is very susceptible to the influences injurious to bacterial life; and its ready control by the processes of disinfection, chemical and mechanical, is assured. 9. The bacillus icteroides produces *in vitro*, as

well as *in vita*, a toxin of the most marked potency; and, from our present knowledge, there exists a reasonable possibility of the ultimate production of an antiserum more potent than that of Professor Sanarelli." See SERUM THERAPY.

YOUNG, JOHN RUSSELL, librarian of Congress, died in Washington, D. C., January 17, 1899. He was born at Downingtown, Penn., November 20, 1841; was educated at the Harrison grammar school in Philadelphia and the high school in New Orleans. Upon leaving the latter institution at the age of sixteen he was employed on the *Philadelphia Press*, for which at the breaking out of the Civil War he went as correspondent with the Army of the Potomac, remaining with it until after the battle of Williamsburg. He won much credit for his report of the battle of Bull Run. In the spring of 1864 he served as correspondent for the *Press* with General Banks in the Red River expedition. The following year he went to New York and soon became a contributor to the *Tribune*, and in 1866 was appointed by Mr. Greeley to the managing editorship. After three years he resigned this position, and having meanwhile studied law was admitted to the New York bar. In 1870 Mr. Young established the *New York Standard*, which was not a financial success. This same year while in Europe on government business, he wrote a series of brilliant letters, including an account of the siege of Paris. He accepted an editorial position on the *New York Herald* in 1872, serving in London and Paris, where he had charge of the foreign news department. In 1877-78 he accompanied General Grant on his tour of the world, acting as correspondent; he subsequently published in two volumes *Around the World with General Grant*. Mr. Young resumed his work on the *Herald* in 1879, continuing until 1882, when he was appointed minister to China by President Arthur. After his return to the United States in 1885 he was not attached to any newspaper except the *Philadelphia Star*, in which he had a proprietary interest. In 1889 he declined the Chinese mission offered him by Secretary of State Blaine. He was president of the Union League Club of New York in 1893-94. In June, 1897, President McKinley appointed him librarian of Congress to succeed Mr. Ainsworth R. Spofford, who had resigned on account of age. In this position Mr. Young did excellent work. Under his supervision a reorganization of the library staff was effected, and the library itself was transferred from the capitol to the new building.

YOUNGHUSBAND, Lieutenant-general, CHARLES WRIGHT, retired, British soldier and scientist, died in London on November 1, 1899. General Younghusband's active military career extended from 1837 to 1880, during which time he was appointed to more important and varied positions than falls to the lot of the average British officer. This was due in part to his scientific attainments, by which he won a reputation equal to that of his military career. He was born in Scotland in 1821, and was educated at the Royal Military Academy at Woolwich. His official life from the latter period may be summarized as follows: Joined Royal Artillery, 1837; appointed to Magnetic and Meteorological Observatory, Toronto, Canada, 1840-46; reducing magnetic and meteorological observations taken at the observatories at Cape of Good Hope, Toronto, etc., under the late Sir Edward Sabine, 1846-53; commanding company of Royal Artillery at Gibraltar, 1854; service in Crimea, winning (at Inkerman) medal with two clasps, 1854; secretary Royal Artillery Institution, 1854; superintending contracts for small arms, swords, bayonets, etc., in Belgium and Germany, 1857-63; ordnance select committee, 1863-67; commissioner in charge of war material, Paris Exposition, 1867; superintendent Royal Gunpowder and Gun-cotton Factory, Waltham Abbey, 1868-75; superintendent Royal Gun Factories, Royal Arsenal, Woolwich, 1875-80; retired 1880. Upon entering civil life he turned renewed attention to scientific studies, and devoted his time to contributing to magazines and scientific and military journals, and to the pursuit of various scientific experiments.

YOUNG MEN'S CHRISTIAN ASSOCIATION, founded by George Williams in 1844 as a religious society of clerks in the city of London, has now spread to every civilized country, having a total membership of over half a million. In America, where the first association was founded in 1851, there were in 1898 a membership of 228,568 in 1233 associations. These own property valued at \$19,341,272. In the Philippines, Cuba, and Puerto Rico the work of the Y.M.C.A. in elevating the morals of the soldiers met with good results in 1899, and branches have been opened in 15 regular army posts. In Great Britain there are 1490 associations and 105,196 members, 13,000 being in London. President, Sir George Williams; secretary, W. H. Mills, Exeter Hall, Strand, London. The international committee of Young Men's Christian Associations have headquarters at 3 West Twenty-ninth Street, New York City. Chairman, Lucien C. Warner; general secretary, Richard C. Morse.

YOUNG PEOPLE'S CHRISTIAN UNION (OF THE UNITED BRETHREN IN CHRIST), organized in 1890, had 1970 societies in 1899 with a membership of 74,942.

General meeting for 1900 at Lebanon, Penn., June 21-24. Publishes *The Watchword*. President, Professor J. P. Landis; secretary, Rev. H. F. Shupe, Dayton, O.

YOUNG WOMEN'S CHRISTIAN ASSOCIATION OF THE CITY OF NEW YORK, founded in 1870, to promote the temporal, social, mental, moral, and religious welfare of young women dependent upon their own exertions for support, has main building on Fifteenth Street, New York City. Other branches of the association's work are carried on in the Margaret Louisa Home, on Sixteenth Street, the West Side Settlement, 453 West Forty-seventh Street, and the Seaside Home, at Asbury Park, N. J. The membership in 1899 was 773. President, Mrs. Clarence E. Beebe; corresponding secretary, Miss J. F. Bangs, 29 East Forty-fourth Street, New York City. An International Board of Women's and Young Women's Christian Associations in the United States and Canada held its fifteenth biennial conference at Memphis, Tenn., in November, 1899, and was incorporated in 1899. The conference for 1901 will be held in Cleveland, O. The international board publishes the *International Messenger*.

ZANGWILL, ISRAEL, author, was born in London, 1864. After some time spent in teaching, he became a journalist, and edited *Ariel*; his writings include poems, plays, novels, and essays; as a lecturer in his own and in this country, as well as in Holland and in Jerusalem, he has drawn large audiences. Publications: *The Premier and the Painter*, 1888; *The Bachelor's Club*, 1891; *The Big Bow Mystery*, 1892; *The Old Maid's Club*, 1892; *Children of the Ghetto*, 1892; *Merely Mary Ann*, 1893; *Ghetto Tragedies*, 1893; *The King of Schnorrers*, 1894; *The Master*, 1895; *Without Prejudice*, 1896; *Dreamers of the Ghetto*, 1898; and *They That Walk in Darkness*, 1899. He visited this country in 1899 to superintend the production of his four-act drama, *Children of the Ghetto*, founded on the book.

ZANZIBAR, PROTECTORATE OF, in British East Africa, consists principally of the island of Zanzibar, area 625 square miles, population 150,000, and the island of Pemba, area 360 square miles, population 50,000, and a small strip of mainland, and is governed by the sultan of Zanzibar under a British commissioner. The city of Zanzibar, on the island of the same name, is the largest town in East Africa, with a population estimated at about 100,000, made up of many races, including natives, Arabs, English, Germans, French, Italians, Portuguese, Hindoos, and a few Americans. It is also the most important port, while the island itself is an important way station, seat of production, and trading centre of eastern Africa. The principal products and exports are cloves, copra, cocoanuts, ivory, shells, hides, and goat skins; a large export trade from the mainland also passes through Zanzibar. Most of the latter is in bulk for through transportation, and consequently does not appear in the export statistics of the protectorate. The few industries of Zanzibar are chiefly devoted to the manufacture of bone, ebony and silver ornaments. The foreign import trade is considerable, including also transit trade bound for Africa. There is also quite a large internal trade. Foreign trade is chiefly with the following countries in the order named: India, Great Britain, Germany, America, Netherlands, France. In respect to goods exported from Zanzibar, the principal receiving countries are, in the order named, England, France, United States, and Germany. The value of exports to the United States amounted in 1898 to \$226,936, the principal items being ivory, cloves, and hides. The latest estimates give the tonnage of vessels clearing at the port of Zanzibar in 1898 as 286,209, which does not include the large coasting traffic with Bombay, Arabia, the Comoro Islands, and Madagascar. There were 88 German vessels, 62 British, 25 French, and 8 of other nationalities. Previous to 1899 a few stipulated articles of import were taxed 5 per cent ad valorem. In September, 1899, the rate was made to cover all imports except coins, coal, rubber, ivory, hippopotamus teeth, rhinoceros horns and hides, and tortoise shells; there are also small rates placed on certain exports. Imports to Pemba pay 5 per cent duty. The public revenue, derived from customs dues, water-supply, registration, rents of government property, port dues, shipping, and the post-office, yield about \$600,000 a year, and about equal the expenditures. There is no public debt.

In November, 1899, through the Samoan treaty (*q. v.*), Germany agreed to relinquish her extraterritorial rights in Zanzibar from such time as Great Britain should abolish similar rights there. The English exercise general control in the protectorate, having organized a regular government in 1891. An Englishman is the prime minister of the sultan, and a British agent has since 1892 held certain judicial authority, having the right to try all cases in which British subjects are involved, and having admiralty jurisdiction in regard to the slave trade. The accounts of the government must be always open to the inspection of the English representative, and no public expenditure can be undertaken without his consent. Slavery was abolished when Great Britain gained control, but the British and Foreign Anti-Slavery Society has since declared that the decree is a dead letter. A debate in the British Parliament in 1899 upon the decree of a district agent at Mombasa, who had

ordered three slaves back to their owner, brought to public notice the existence of slavery on the Zanzibar mainland. It is urged by those who favor the present system that the bestowal of liberty upon the Zanzibar negroes would be more harmful than helpful. There are no means of livelihood open to the 280,000 persons who are, technically speaking, slaves. However, they have their own houses, the tenure of their bondage is fixed, and they cannot be sold by their masters or separated from their wives and families. In 1899 the British agent and consul-general was Sir Arthur H. Hardinge, the commissioner of British East Africa.

ZEBMAN EFFECT. See PHYSICS.

ZINC. The corrected returns for the year 1898 give the production of spelter at 115,399 short tons. The last two years have witnessed an interesting struggle between the smelting plants of Missouri and Kansas which used coal fuel, and the newer works in Kansas, which lie in the natural gas fields. It is obvious that the advantage of free gas will bring about many economies in the course of the metallurgical operation and may result in the shutting down of the older works, and the establishment of a new productive centre. The zinc-mining industry of the Joplin district of Missouri has had an enormous boom during the year 1898, and also 1899. Much of the United States production is exported for the manufacture of the high-grade brass in Germany and other countries of Europe. At the same time much also is imported, this being especially true not only of spelter, but of zinc oxide, the foreign product being purer and whiter than the native material. The imports for 1898 or 1899 were as follows:

Block or pig-zinc.....	\$109,626
Sheet zinc, 1897.....	\$786
Manufactured zinc, 1897.....	\$11,459
Zinc oxide, 1897, dry.....	5,564,763 pounds
Zinc oxide in oil.....	302,357 pounds

The exports of zinc and zinc ores amounted in 1898 to \$1,475,761. The Joplin zinc region of Missouri has sprung into unusual prominence during the past year, and mining activity has been intense. This increase in the development and output of the region is said to be due to the greatly increased demand for spelter, the discovery of a wider market for the ores and also to the organization of the Missouri and Kansas Zinc Miners' Association.

ZOLA, EMILE. See FRENCH LITERATURE.

ZOOGEOGRAPHY. See ZOOLOGICAL LITERATURE (paragraph Special Treatises).

ZOOLOGICAL LITERATURE. The amount of zoological literature which has appeared during the year 1899 is probably greater than in any preceding year, but it is impossible to give any accurate estimate of it. We shall probably not exceed the limits of the truth, if we say that 10,000 papers, pamphlets, and books, dealing more or less with zoology, have appeared during the year. Of course, we can only touch on the more important of these.

Periodical Literature.—There have been a few changes in the publications given up wholly or in part to zoology, and among these the following may be noted: *Natural Science* suspended publication with its December issue, much to the regret of those who have had the privilege of enjoying it. In spite of the high standard which it set and maintained, it has not been enough of a financial success to warrant its further publication. The *American Naturalist* has changed editors, but has had a good year. Its numbers have nearly all been late in appearance, but the contents have been varied and of high quality, and a large share of them have dealt with zoological questions. One of the important features of the year has been the beginning of a series of papers dealing with the various groups of the North American fauna, and furnishing a key to the species. Several of these, dealing with certain groups of invertebrates, have already appeared. The *Zoological Bulletin*, which began its career in 1898, was changed in April of the past year to the *Biological Bulletin*, and is now published under the auspices of the Marine Biological Laboratory. Under its new title, it is intended to include general biology, botany, and physiology, as well as zoology.

General Treatises.—Beyond any question the most notable work on general zoology published in 1899 is *The Foundations of Zoology*, by Professor W. K. Brooks, of the Johns Hopkins University. The book is made up of 13 chapters, dealing with the fundamental topics of zoological science, such as "Nature and Nurture," "Zoology and the Philosophy of Evolution," "Natural Selection and the Antiquity of Life," "Natural Selection and Natural Theology," etc. It also treats of the views of nature held by such eminent zoologists as Lamarck, Huxley, Galton, Weismann, Darwin, and Agassiz, and by the philosophers Paley and Berkeley. The text of

most of the lectures is that "life is response to the order of nature." The contents of this book of some 340 pages consists of a series of lectures delivered at Columbia University, and they are now published as Volume V. of the *Columbia University Biological Series*. That the book will rank not only as the foremost zoological publication of the year, but as one of the most notable that has ever appeared in philosophical zoology, seems clear. President Jordan, of Leland Stanford Junior University, in a review published in *Science*, says: "Brooks's lectures on the *Foundations of Zoology* constitute a book that will live as a permanent addition to the common sense of science. It belongs to literature as well as science. . . . There is not an idea fundamental to biology that is not touched and made luminous by some of these sagacious paragraphs. . . . The hand of the master is seen in every line. The main lesson of the work is that to believe is not better or nobler or higher than to know. Belief adds nothing to certainty, and whatever is really true is the very best thing that could be true, else it had not been so. . . . The stones which Dr. Brooks has chosen as the foundations of zoology will remain there for centuries, most of them as long as human wisdom shall endure. The volume is a permanent contribution to human knowledge, the worthy crown of a life of wise thought as well as of hard work and patient investigation. If there are any errors in statement or conclusion from one end of the book to the other the present writer is not astute enough to find them out, and Dr. Brooks's logic may permit him at least to doubt their existence. The biologists of America have long since recognized Dr. Brooks as a master, and this volume, the modern and scientific sequel of Agassiz's *Essay on Classification*, places him in the line of succession from the great interpreter of nature, whose pupil and friend he was."

There is no other book in the same class with *The Foundations of Zoology*, but other books have been published in 1899 bearing on the same or similar subjects. Among these may be mentioned a volume embodying four lectures by Mr. F. W. Hutton, F.R.S., on *Darwinism and Lamarckism, Old and New*. These lectures were delivered at intervals of several years, and date from 1882 to 1898. They were delivered to mixed audiences, and were intended as a popular exposition of Darwinian doctrine; with the exception of perhaps one chapter they seem to perform their mission well. A book of a very different character from these, but dealing with general questions of biology, is Professor C. B. Davenport's *Experimental Morphology, Part Second*, a volume of 228 pages, devoted to a consideration of the phenomena of growth. Although most of the illustrations are from plant physiology, this is due chiefly to the fact that we know far more about the growth of plants than of animals. Growth is defined as "increase in volume," and from that point of view the subject is treated. The effects of chemical agents, of water, of density of medium, of molar agents, of gravity, of light, and of heat, are all treated in turn, but comparatively little space is given to some phenomena which influence growth, as, for example, electricity. On the whole, the book is a valuable summary of our knowledge of the subject up to the present time. Another volume of Professor Davenport's is *Statistical Methods, with Special Reference to Biological Variation*. The first fifty pages of the book are occupied with an outline of methods and formulæ, while the remaining one hundred pages are taken up with a great variety of numerical tables arranged in a convenient way for use. A very different book from these is Dr. James Weir's *Dawn of Reason*, a volume of 234 pages dealing with the mental processes of animals. Although psychological, it is a thoroughly zoological book, and contains a large amount of interesting matter, the result of much observation and some experiment. But the author is evidently an ardent partisan, and many of his observations, as well as his conclusions, are vitiated by his enthusiasm. It is enough to say that he states as facts the "intentional beautifying" of its web by a spider, the "fright" of Rhizopods and even their "amusement"! A new edition has appeared of Professor C. Lloyd Morgan's *Animal Biology*, a well-known book which first came out in 1887. The present edition has been revised and in part rewritten, and several illustrations now appear in the work for the first time.

Text-books.—The year has not been productive of text-books in zoology, the two preceding years having pretty well supplied the market. The most noteworthy publication of the year in this line is the completed translation of the well-known German *Text-book of Embryology*, by Professors Korscheldt and Heider, so that there is now easily accessible to English students and readers an admirable text-book of the comparative embryology of invertebrate animals. The only other text-book of any importance which has appeared in America in 1899 is a *Text-book of Vertebrate Zoology*, by Professor J. S. Kingsley, of Tufts College. This is a volume of some 440 pages, and is intended for the use of students in the laboratory, as well as for the class-room. In England, Mr. A. E. Shipley has published a text-book for students called *Zoology of the Invertebrata*, another volume in a field already richly supplied. In Italy, Professor Achille Griffini has published a large *Zoologia* of 400 pages. It is profusely, if not well, illustrated, but the text is not very original

or otherwise notable. The book is designed for use in the public schools in accordance with the requirements of the state.

Systematic Zoology.—The literature of systematic zoology is most abundant in periodicals, and especially in the publications of societies and academies. During the past year this sort of literature has not shown any notable increase over the preceding year. About 4000 new species of animals have been described, of which nearly three-fourths have been insects. Of the remainder about one-fourth are *arthropods* (other than insects), and one-fourth are worms. About 200 species of vertebrates have been described, of which a third are birds. Of all classes of animals, the smallest number of new species have been described from the *echinoderms*. Aside from the periodical literature, a few noteworthy volumes have appeared dealing with systematic zoology. Doubtless the most important of these is the final part of Trouessart's *Catalogue of Mammals, Living and Fossil*. The completed work consists of 1358 pages, with an index of 109 pages and 16,827 entries. It recognizes 1840 genera and subgenera, and about 7500 species. The work is of the greatest value to every student of mammals and contains much information of interest even to those who are not specialists. Another work on vertebrates is Dr. Hans Gadow's *A Classification of Vertebrata, Recent and Extinct*, which has been described as "an exceedingly concentrated extract of a full text-book of the vertebrates." It is intended primarily for the student and includes only the larger subdivisions of the vertebrate phylum. Among systematic works on invertebrates, there are four which deserve to rank high as monographs on their respective groups. One of these is Ludwig von Graf's magnificent work on the *Triclad*s, not only cataloguing the species already known, but adding a very large number of new species to the group. It is one of those remarkable pieces of detailed work for which German zoologists are famous. Another valuable invertebrate list is by the well-known Norwegian zoologist, Professor G. O. Sars, and deals with the *Isopod Crustaceans of Norway*. It is the second volume in Professor Sars's great work on the Norwegian crustacea. The third volume to be mentioned is a monograph on the deep-sea *Ophiuroidea from the Indian Ocean*, by Professor R. Koehler, published by the trustees of the Indian Museum. The work is chiefly occupied with the description of forty new ophiurids collected by the Royal Indian Marine Survey-ship, *Investigator*. The monograph is elaborately illustrated by fourteen exquisite plates, photo-etched from the author's drawings. The fourth noteworthy monograph is by Alphonse Labbé, and bears the title *Das Thierreich Sporozoa*. This is one of the series of volumes now being published by the German Zoological Society in which are to be given recognizable descriptions of all known animals. The volume on the *sporozoa* contains not only the brief description of each species, but also a well-arranged list of the "hosts" of *sporozoa*, with the organs affected, and there is also a key to families, genera, and sometimes to species.

Special Treatises.—Under this head we may treat the published zoological results of certain scientific expeditions, as well as important publications concerning special animals or groups. Part II. of the *Zoological Results* of Dr. Willey's trip to New Guinea and the South Seas has appeared, and deals with the millepores, echinoderms, sipunculids, corals, fleshy corals, and earthworms. It is a pity that these very important papers have not all been published in some of the numerous scientific journals, where they could have had a wider circulation. The results of another scientific expedition also appeared during the year. This expedition, though not primarily zoological, did no little collecting, and yielded valuable zoological results. This was the *Second Bottego Expedition* which made explorations in Abyssinia in 1895-97, under the auspices of the Italian Geographical Society. The expedition proved disastrous to its leaders, as Bottego and Sacchi were killed, and those who finally escaped underwent terrible hardships. The present volume contains a summary of the zoological results which have previously appeared in a series of reports by specialists. During 1896-97, the United States government, through a commission, of which President D. S. Jordan, of Leland Stanford Junior University, was head, made investigations concerning the *Fur Seals and Fur Seal Islands of the North Pacific Ocean*, and the results have just been issued by the Treasury Department in four large volumes, the typography and illustrations of which are excellent. They contain 1637 pages of reading matter, and 250 plates, charts, and maps, and are doubtless the most important contribution to the literature of seals and sealing that has ever appeared. The volumes contain a great deal of zoological literature besides that which bears directly on the seals, for they exploit quite fully the land and marine fauna of the Pribilof Islands.

An important work on the geographical distribution of mammals has appeared from the pens of two of England's best known zoologists, Messrs. P. L. and W. L. Sclater. It is a volume of some 350 pages, called *The Geography of Mammals*. The book treats of the terrestrial and marine divisions of the globe, based on mammalian distribution, and of the distribution of the various orders of mammals. The remark-

able Patagonian mammal described last year as *neomylodon* has been the subject of several interesting and important papers during the past year, the most notable of which is called *The Mysterious Mammal of Patagonia*, and the authors are Drs. Hauthal, Roth, and Nitsche. They have made thorough investigations, and have reached the conclusion that *neomylodon* is an *extinct* edentate, previously described as *Grypotherium*, and the Patagonian form that has caused so much discussion is to be called *G. domesticum*, because these writers think it was domesticated by the Indians. Two other special treatises may be mentioned, the first of which deals with the frog, the second with *Ascidia*. The former is the third part of Gaupp's edition of Ecker on the *Anatomie des Frosches*, and deals solely with the anatomy of the vascular system. As the volume contains over 300 pages and is fully illustrated, the treatment of the subject may be said to be exhaustive. The volume entitled *Ascidia* is from the pen of Professor W. A. Herdman, and is published as a memoir of the Liverpool Marine Biology Committee. It contains about fifty pages and five plates, and is devoted to a thorough account of the anatomy of *ascidia*. It is notable because of the plan of the work and the auspices under which it is published.

Popular Books.—Popular books in zoology and natural history have been rare during 1899 and there are only a few to be mentioned. Mr. J. N. Baskett is the author of a recent book called the *Story of the Fishes*. While not always careful in its statements, the book is attractively written and well illustrated, and will prove useful to a beginner. A more satisfactory book in some ways is by Margaret W. Morley, and deals with the honey bees. It is called *The Honey Makers*, is well written and illustrated, and includes a great deal of a historical and literary nature concerning bees. Doubtless the best book of the year written for popular reading is Dr. Richard Semon's *In the Australian Bush and on the Coast of the Coral Sea: being the Experiences and Observations of a Naturalist in Australia, New Guinea, and the Moluccas*. This volume, of over 550 pages, with 4 maps, and 86 illustrations, is fascinatingly written and brimful of interest. Few men are better fitted than Dr. Semon to write such a book, and his natural enthusiasm and love of nature combine to make this volume exceptionally readable. See BIOLOGY; ENTOMOLOGY; FISHERIES; ORNITHOLOGY.

ZOOLOGICAL SOCIETIES. The meetings of zoological societies during 1899 seem to have been well attended, and of rather more than usual interest. To be sure there was no international congress of zoologists this year, and, excepting the Ornithological and Entomological Societies (*q. v.*), the meetings of zoologists have generally been in connection with some of the larger scientific bodies, such as the American or British Association. So far as any reports at hand show, the continental societies held very successful meetings. The French Association held its annual meeting in September at Boulogne, on the same days that the British Association was meeting at Dover. Several hundred men of science attended its meetings, and a large number visited the English scientists across the Channel. The seventy-first meeting of the Society of German Naturalists and Physicians was held in Munich, September 17-23. About 3500 members were in attendance, the general meetings being held in the Royal Theatre. The most interesting feature from a zoologist's point of view was the exhibition of the results of the German Deep Sea Expedition, explained by Professor Chun. Many of the results of this expedition were confirmatory of the results obtained by the *Challenger*, especially as regards life existing in the depths of the Antarctic Ocean. The anniversary meeting of the Royal Society of London, held November 30, was of interest to zoologists because of the conferring of one of two royal medals on Professor W. C. McIntosh for his important labors as a zoologist. His most notable work is a monograph of British annelids, which is still in progress, and being published by the Ray Society. But the honor is conferred on him not only as an investigator, but as "a notable teacher in Scotland" as well. The annual "Conversazione" of the Royal Society, held May 3, was also of interest to zoologists, because of a number of notable zoological exhibits. Chief among these were a selection of zoological specimens from Christmas Island, and portions of the skin of the extinct ground sloth of Patagonia.

The New York Academy of Sciences held its annual reception April 21, and though there were no unusually remarkable exhibits, there were many of great interest. In the zoological section, the beautiful case illustrating the nesting habits of the brown pelican seemed to attract the most attention. The National Academy of Sciences has held two very successful meetings, the annual meeting in Washington, April 18-20, and the autumn meeting in New York, November 14-15. At the latter, however, there were no zoological papers presented. At the spring meeting, 5 of the 14 papers were distinctly zoological, two of these being presented by Professor Brooks, and two by Professor Agassiz. (See BIOLOGY.) The New York Zoological Society, which now numbers nearly 800 members, has had a most successful year, the Zoological Gardens having been opened on November 8. The gardens are situated in South Bronx Park, and are the largest in the world, being five times the size of

those in Paris, and nearly eight times as large as those at Philadelphia, or the well-known Zoo in London. The cost of these gardens and their maintenance is shared by the city of New York and the New York Zoological Society, although the former does not furnish all the funds desired by the latter. There are now about 850 animals installed, and an illustrated guide has been published with a great deal of useful and interesting information regarding them. Although the American Microscopical Society is not strictly zoological, several of the papers presented at its twenty-first annual meeting in Columbus, O., in August, were chiefly of interest to zoologists, the most notable being Professor Eigenmann's paper on "the Eyes of Typhlomage from the Artesian Wells at San Marcos, Tex."

British Association for the Advancement of Science. Section D, Zoology.—The annual meeting of the British Association was held at Dover, September 14-21, and was attended by some 1400 members. It was an especially notable occasion, because of the visits from and to the French Association, which was meeting at Boulogne at the same time. The presidential address to the Zoological Section was delivered by Professor Adam Sedgwick, and was entitled "Variation and Some Phenomena Connected with Reproduction and Sex." This most important contribution to the question of heredity is extremely interesting. The author considers that one of the most important results of evolutionary change has been the gradual increase and perfection of heredity as a function of organisms, and the gradual elimination of variability. Some very striking conclusions may be drawn, if the truth of this fundamental proposition is conceded. The other fourteen papers were not as extensive, and few of them were specially noteworthy. Seven of them dealt with fish or fisheries, while only two dealt with invertebrates. Nine different committees submitted reports to the section, but only one of these was final, that on the zoology and botany of the West India Islands. The material still unworked has been presented to the British Museum. Aside from the presidential address, the chief interest of the section seemed to centre about Mr. Garstang's work in a biological survey of the British Channel, and in rearing young sea-fishes, in which he has been quite successful. At a meeting of the delegates of the Corresponding Societies, an interesting paper was read "On the Living Subterranean Fauna of Great Britain and Ireland." The paper led to quite an animated discussion, and it was finally recommended that the Corresponding Societies give special attention to the fauna of wells and caves.

The American Association for the Advancement of Science. Section F, Zoology.—The forty-eighth annual meeting of this society was held August 21-26, in the buildings of Ohio State University, at Columbus, O. There were 352 members in attendance, and the meetings were interesting and enjoyable. Of the 273 papers presented, 19 were before the zoological section. Two of the grants of money made are of special interest to zoologists, one being \$50 to Professor Davenport, of Harvard, for the quantitative study of variation, and the other, \$100, to Professor Eigenmann, of Indiana, for stocking pools with species of blind vertebrates, where they may be reared and studied in the light. The address of the chairman of the zoological section, Professor S. H. Gage, was on "The Importance and the Promise in the Study of the Domestic Animals." In this address, the speaker points out the great profit that has come to science and to mankind from the study of domesticated forms, and he urges young zoologists to give their attention to the "thorough investigation of a few forms from the ovum to youth, maturity, and old age." And he believes that "the greatest good to science, and thus to mankind, will result from a selection of domesticated forms for these thorough investigations." One of the most interesting papers read was also by Professor Gage on the "Brook Lamprey," in which it was shown that the brook lamprey is not a parasitic form like the lake lamprey, but it is almost certain it is descended from a parasitic form. Among the remaining papers, there were many of great scientific value, but the one that was perhaps of the most general interest was by Professor C. H. Eigenmann on "Cave Animals." Cave fauna seem to be derived from those animals which are accustomed to seek their food under rocks and logs, and in other dark places. A gradually disappearing light leads to an increase in the size of the eyes, whereas the gradual disuse of the eyes decreases their size. The evidence seems to show that disuse effects are transmitted.

American Society of Naturalists. American Morphological Society.—The meeting of the "Naturalists" was held at New Haven on December 27-28, in the buildings of Yale University. One of the features of the meeting was the discussion of the theme, "The Position that Universities Should Take in Regard to Investigation." Zoology was represented by Professor William Patten, of Dartmouth, who took the ground that there was danger of too much emphasis on research work, and that the universities would not train properly equipped teachers. He urged reforms in the matter of requiring strictly original work for the thesis, and in making the thesis of less, the examinations of more account. The lecture by Professor A. E. Verrill on "The

Geology and Natural History of the Bermudas" was generally enjoyed. The subject was an interesting one in itself, but the interest was greatly increased by the large number of slides with which it was illustrated. The slides of many of the animals were drawn and colored for the purpose from living specimens, and many of the fishes and sea anemones of Bermuda are of extraordinary beauty. The meetings of the Morphological Society were attended by about 40 members. There was quite a falling off in the number of papers presented, only 33 being read. Of these, more than half dealt with the chordata, and half of the remainder with worms. Naturally the papers varied greatly in length and importance, though the fifteen-minute rule was pretty strictly enforced, not always to the satisfaction of the speaker. It is difficult to select from the list of titles the papers which proved the most interesting or that are the most worthy of note. Mention should be made, however, of Dr. Bashford Dean's paper on "The Embryology and Phylogeny of *Chimæra*," an elasmobranch fish of which we as yet know comparatively little; of Mr. P. M. Rea's "Notes on the Structure of *Alma Nilotica*, a Gilled Earthworm from Egypt," and of Messrs. Johnson's and Hall's "Palæmonetes and Salinity, an Experimental Study in Evolution." See also ORNITHOLOGY AND ENTOMOLOGY.

ZOOLOGICAL STATIONS. The year 1899 has been remarkable in the matter of zoological stations, because of the large number of scientific expeditions, which have either set out or returned within the limit of those twelve months. While, strictly speaking, these are not zoological stations, it is only fair to regard those which make zoological collections, and study the fauna of the regions which they explore, as a sort of moving station, and they may conveniently be considered under that head.

Permanent Stations.—First, however, it will be advisable to speak of those stations which have a more or less permanent abode, and are designated by some local name. Nothing very unusual seems to have occurred at any of the European stations; so far as any reports have been made, the season has been a prosperous one. The two principal English stations, at Plymouth and at Port Erin, have continued their admirable work, and proved their great value not only to English biologists, but to the British fisheries as well. The Japanese have established a station on the Inland Sea for the study of the fauna and flora of that most interesting body of water.

In our own country, the most important stations have enjoyed a prosperous year. The Hopkins Seaside Laboratory at Pacific Grove, Cal., is the centre for biologists on the Pacific coast, while in the East there is a division of interests. As in former years, the majority of workers have been at Woods Hole, where the facilities of the United States Fish Commission Laboratory offer unusual attractions. The Marine Biological Laboratory was attended by over 150 students, and the season was very successful. The Fish Commission Laboratory had its full quota of workers, and much of the work done there is to appear in the *Bulletin* of the commission. The *Fish Hawk* and the *Grampus* were at the disposal of the laboratory during July and August, and proved a great help. The commission operated two fish-traps throughout the season, one in Buzzards Bay and one in Vineyard Sound, and thus there was each day an abundance of fish, squid, etc., for the various workers who desired them. Some of the captures were of much interest, and a number of new species were added to the list of species known from Woods Hole. (See FISHERIES.) Besides its fine establishment at Woods Hole, the fish commission has during the past season had a laboratory open at Beaufort, N. C., and a fresh-water station at Put-in-Bay, O., on Lake Erie. The laboratory at Cold Spring Harbor, L. I., under the auspices of the Brooklyn Academy of Sciences, has had its most successful season, and bids fair to be a rival of Woods Hole in popularity. The work of the past summer has attracted unusual attention to this station, and some important and interesting results of the season's work have already been published. Of the fresh-water stations, that of Indiana University seems to have had the most notable season. This station is now located on Winona Lake, the well-known summer resort, the buildings having been given to the university by the Winona Assembly for a biological station. The surroundings seem to be peculiarly favorable for collecting and out-of-door study. The number of students in attendance the past summer was 91, and courses were given in zoology, botany, cytology, bacteriology, embryology, and survey-methods.

Foreign Expeditions.—Under the auspices of the German government, the *Valdivia* has been making explorations and collections in the Antarctic Ocean, but as yet not enough of her results have been made public to warrant any comments on her zoological work. It is worthy of note, however, that the Royal Society of London has succeeded in getting the British government so greatly interested in the Antarctic exploration, that they have been promised \$225,000 on condition that they raise a like sum, for the equipment of an expedition, which it is hoped to get under way next year. Another survey, more strictly zoological, which has been undertaken by Her Majesty's government (or, more properly, by the Egyptian government,

with the aid and support of the British Museum) is that of the Nile, with special reference to the fish, though other groups of animals are not to be neglected. It is expected the survey will require three years for its completion, and it will possibly be carried south, even to Albert Nyanza. Work has already begun on Lake Menzaleh. During the early part of 1899, a biological survey of the island of Socotra, which lies about 150 miles off the extreme eastern point of Africa, was carried on by the British Museum and Liverpool Museum working together. The expedition was a great success, the collection being large and containing many species of animals new to science. The full results are to be published in a special volume which is now in preparation. Another survey of considerable importance was carried on under the auspices of the British government in India, in the Bay of Bengal. Soundings and collections were made between the mainland and Andaman Islands, and a great deal of valuable zoological material was dredged, in some places at great depths.

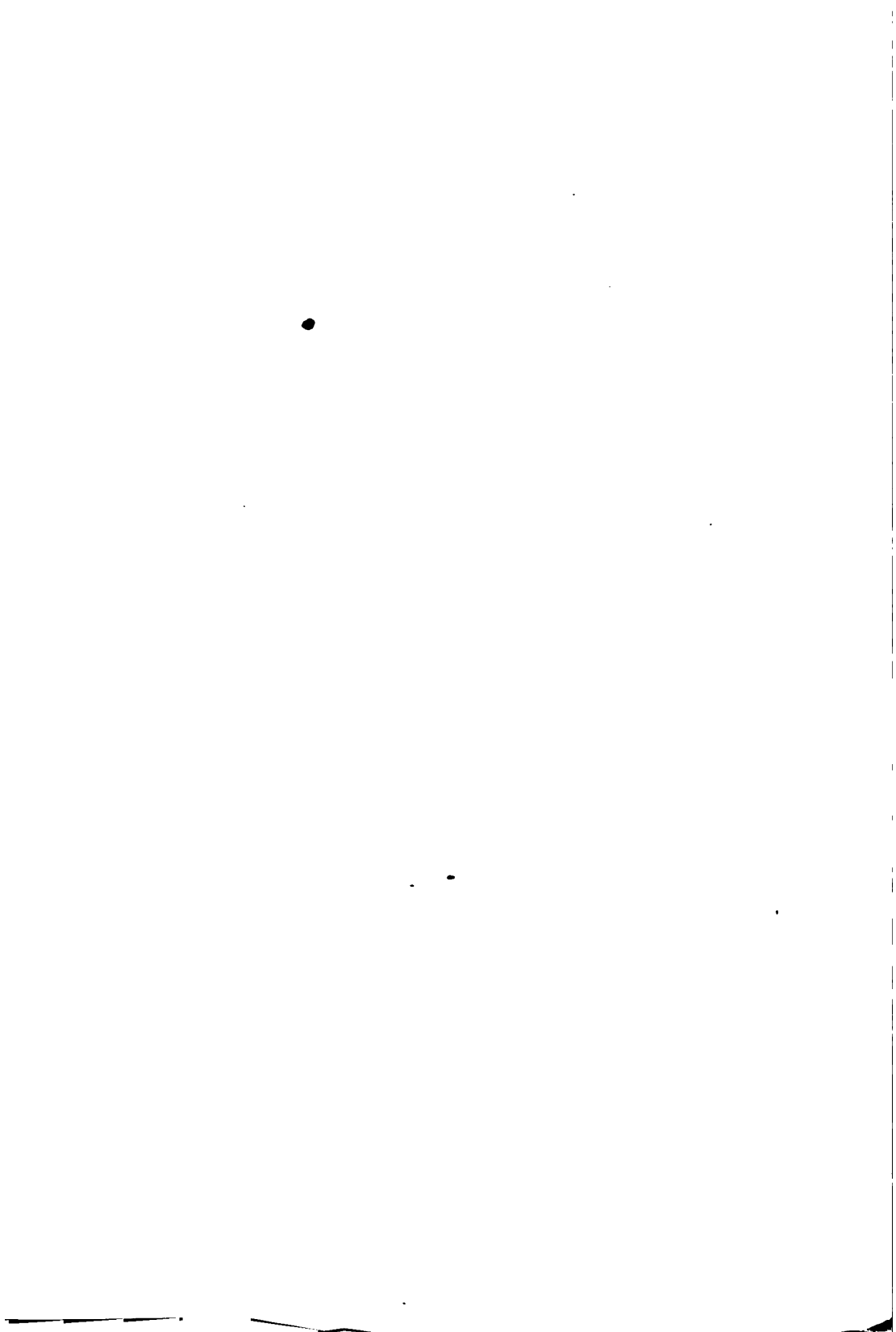
American Expeditions.—Early in the spring, a committee from Philadelphia visited the east coast of Florida with a view to locating a marine biological station somewhere on Biscayne Bay. The collecting, however, proved unexpectedly poor, and the idea was finally given up for the present. New York University, for the third successive season, sent a party to the Bermuda Islands. They located on White's Island in Hamilton Harbor, and enjoyed a most successful season, exploring parts of the coast which they had not previously visited. A number of interesting fish were brought back alive to the New York Aquarium. Messrs. Hunt and Harrington, of Columbia University, again visited the Nile Valley, through the liberality of Charles H. Senff, Esq., of New York City. The expedition was in search of the eggs of *Polypterus*, a curious Ganoid fish, and went far up the Nile, in the wake of the British army. Not only did the main object of the trip fail of fulfillment, but disaster came, in the sickness and death from fever of Mr. Harrington. He was a young man, a graduate of Williams College, just completing his graduate work at Columbia, and his attractive personality had made for him many friends wherever he had been. His sudden death, therefore, is a source of personal grief to many American zoologists. Another American university had collectors in the field in a remote part of the earth, but they met with more fortunate results. This was the third Patagonian expedition from Princeton University, and although it was chiefly for geological material, enough zoological collections were made to warrant a brief statement of the results. The party consisted of Messrs. J. B. Hatcher and O. A. Peterson, and they were gone over eight months. The zoological results of their three trips have been summarized thus by Mr. Hatcher: "A collection of more than 1000 skins, and skeletons of recent birds and mammals, embracing about 150 species of birds and 50 of mammals, and fairly representative of the mammalian and avian life. Extensive collections of fresh water, terrestrial, and littoral invertebrate life."

Harriman Expedition.—One of the two most important expeditions of the year was that known as the "Harriman Expedition to Alaska." Some forty scientists were invited by Mr. Edward Harriman, of New York City, to join him, at his expense, on a trip to Alaska. While not composed exclusively of zoologists, the party included a considerable number of them, and extensive collections, especially in ornithology, were made. The party sailed from Seattle, May 28, and arrived at Portland, Ore., on their return, August 2. They went as far north as Cook's Inlet and Kadiak Island, stopping first at Sitka, Yakutat, and Prince William Sound.

The Albatross Expedition.—The other of the two most important expeditions of the year is under the auspices of the United States Fish Commission and Professor Agassiz. The fish commission steamer, *Albatross*, carries the party, which is in charge of Professor Agassiz. She sailed from San Francisco about August 20 for Tahiti, Society Islands, touching at the Marquesas on the way. Tahiti has been her headquarters, while extensive explorations have been carried on in the Paumotu Islands, an archipelago some 600 miles long, the natural history of which is practically unknown. From Tahiti, the *Albatross* will go to the Tonga Islands, then to the Fijis, and then to the Marshalls, where six or seven weeks will be spent in exploration, as the fauna is almost unknown. She will return to the United States in April, via Honolulu, after a voyage of 20,000 miles. As she is one of the best equipped boats afloat for dredging, trawling and sounding, and is thoroughly fitted out for all sorts of collecting, the results of this expedition promise to be of extraordinary value. Six scientists are in the party besides Professor Agassiz and his son. The results will be published jointly by the fish commission and the Museum of Comparative Zoology. Since the party sailed in August, two long letters have been received from Professor Agassiz and published in *Science*. These deal chiefly with matters of soundings, geography, and geology, and contain little zoological news. The collecting in Paumotu Islands has been disappointing, as animal life is not nearly as abundant as in the Fijis, and some other South Pacific islands. The expedition is the best equipped that has ever been sent out by the United States gov-

eriment, and will undoubtedly rank in importance with the famous Wilkes Expedition of 1838-42. See ZOOLOGICAL LITERATURE.

ZULULAND is now a province of the British colony of Natal (*q. v.*), having been formally annexed, together with British Amatongaland, on December 31, 1897. It lies along the southeastern coast of Africa, between Natal and Portuguese East Africa, and is bounded on the west by the Transvaal. It has an area of about 15,500 square miles and a population of about 181,000, including somewhat over 1000 whites. The province is divided into twelve magisterial districts, and may send one member to the legislative council and two members to the legislative assembly of the colony. The natives follow agriculture and there is considerable mineral wealth, including gold, silver, lead, copper, tin, iron, asbestos, and coal, but there is little development in either branch of industry. With the exception of one district, which is open to whites, Zululand has been given over as a reserve for the natives. In 1899 the territory of the province was entered by Boer troops in connection with operations of the South African war.



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Figure 1. A schematic diagram of the experimental design. The subjects were divided into two groups: the control group and the experimental group. The control group received a standard training program, while the experimental group received a modified training program. The subjects were then tested on a series of tasks, and their performance was compared between the two groups.

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the 1990s, the number of people in the world who are undernourished has declined from 1.1 billion to 800 million. The number of people who are malnourished has declined from 1.5 billion to 1 billion. The number of people who are obese has increased from 100 million to 300 million. The number of people who are overweight has increased from 100 million to 300 million. The number of people who are obese and overweight has increased from 100 million to 300 million. The number of people who are obese and overweight has increased from 100 million to 300 million.

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